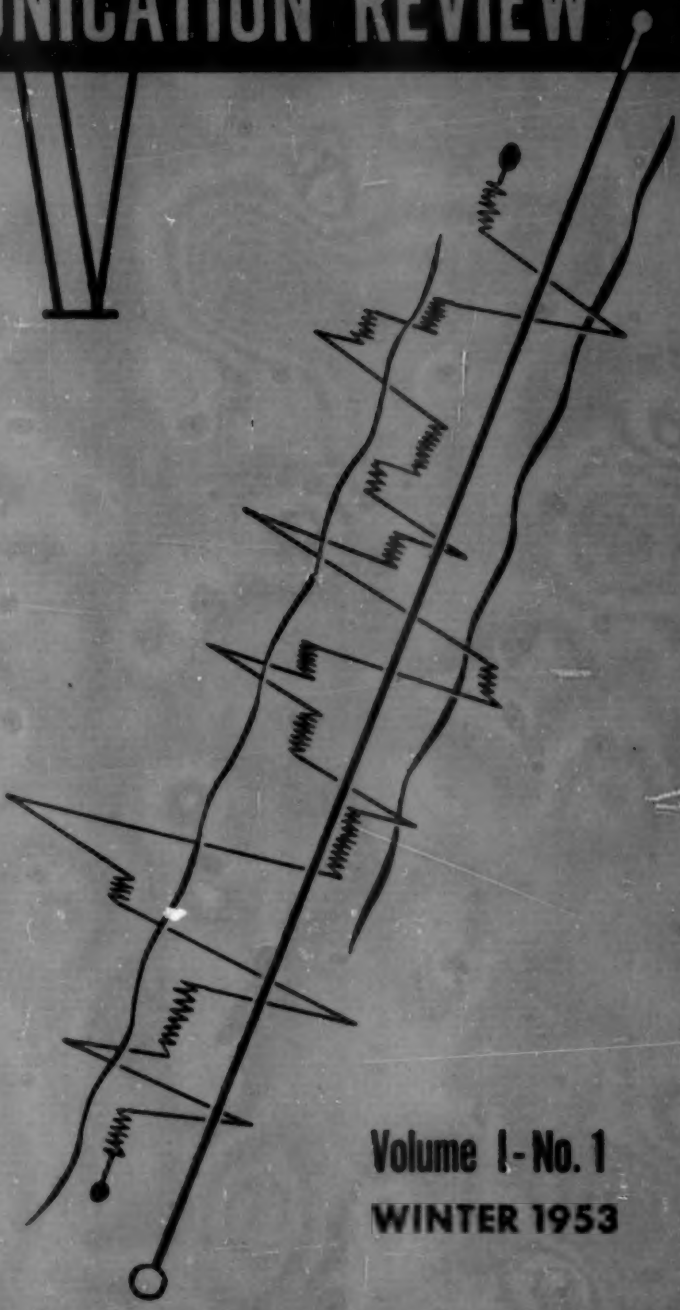
AUDIO VISUAL COMMUNICATION REVIEW



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AUDIO VISUAL
COMMUNICATION REVIEW

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WHAT DOES IT MEAN TO COMMUNICATE?

EDGAR DALE

The audio-visual educator must give serious consideration to the concept of communication if he is to be an effective practitioner. Edgar Dale discusses some of his ideas about communication and what it means to the audio-visual field, and gives some suggestions for research.

Dr. Dale is Professor of Education at Ohio State University.

The launching of this *Audio-Visual Communication Review* is a sign that we are seriously interested in audio-visual research and communication. We are concerned with communication; we are interested in the answer to the question, "What does it mean to communicate?"

I should like to present several ideas on this topic, not with the certainty that I am right, but rather with the notion that these are worth thinking about, not only as we launch a journal, but also as we carry forward our own professional activities.

As I think about the effectiveness of audio-visual materials, I find that reading and thinking about theories of communication are one of my most fruitful methods of evaluation. In short, I ask myself: "What broad theories of communication can I operate under which will be most helpful to me as a writer, a speaker, a teacher, a member of a discussion group, a research worker?" I find John Dewey especially helpful at this point and I read again and again certain excerpts from *Democracy and Education.* Indeed, much of the material in this book seems to bear especially on the problem of communication.

I find *Mind, Self and Society* by George H. Mead provocative. In the introduction to this book, Charles W. Morris says: "Man is essentially the role-taking animal. The calling out of the same response in both the self and the other gives the common content necessary for communication of meaning." Dewey, Mead, and many others who hold similar ideas say to me that if you can put yourself in the other fellow's shoes while you are talking to him and react to your own words, you are likely to communicate. In other words, communication thrives in a mood of mutuality.

Communication, like good human relations, is simply the ability to take the other fellow into account while you are talking or acting. Communication, thus, is not merely interaction. A dog and a cat can interact but they cannot communicate because they have no way of putting them-

selves in the other one's paws. One must, in Mead's terms, be able to take the role of the other in order to secure a common experience.

Basically, our aim in all communication is the widening of the context in which we operate. The further we get away from small, intimate groups, the poorer our communication becomes, yet we live in a world where it is imperative that we get communication between nations. This is not easy because if it were, all films and radio programs would be uniformly successful. They are not successful because individuals have not talked over their own ideas enough with themselves to really understand them, and they do not know how to "talk them over" with others so that the circle of communication will be complete.

I can illustrate this with a film on India that I have just seen. It is warm and friendly. I am quite certain that the Americans who made this film cared about Indian people. They did not see the Indian as unique, exotic, and bizarre, but as having the same homely problems of living that people have throughout the world. It is this caring about the people whom one photographs that is characteristic of a Robert Flaherty or a Julien Bryan.

If we are to communicate effectively, the communicator must know the symbols, the cues, the stimuli to which the other person will react. He must know how much to repeat, how redundant he needs to be. Research can help us at this point. We need to know the words to which a typical fourth grader will easily respond, the words which are barren of meaning. To communicate with a farmer on his specialized terms means that we must put ourselves into his shoes as he talks about contour plowing, hybrid corn, butterfat content. This is not easy to do, yet we often fail to see that we are putting a similar burden on students when we ask them to think in mature ways with which they have not yet had experience.

Sometimes our communication problem is not that of securing additional concrete or semi-concrete experience. Sometimes reading experience may be needed to organize, systemize, correlate, and integrate these experiences. Thus, I can see a series of research studies in which we try to discover how we systemize and generalize rich experiences through reading and discussion. Indeed, some of our most fruitful research may well be in this area of abstraction and generalization. How are generalizations most fruitfully developed and skillfully applied?

The research worker in communication must think a good deal not only about the producing side of communication, but also about the consuming side. The stimuli may be good but the response may be poor. Sometimes we need to discover how to produce good responders—listeners, viewers, readers. Dr. Carl Rogers of the University of Chicago pointed out in a recent lecture that communication would be vitally improved if more of us could listen without constantly passing judgment on what the other

fellow says before we really understand what he means. This is not the issue involved in gullibility, but rather the point that is involved in willingness to understand, a concern for really discovering what the other fellow meant to say. We are so busy trying to refute a man's argument that we do not really hear it. Our unwillingness to understand is probably a measure of our fear of being converted.

The inauguration of this new journal is a sign that we are anxious to discipline our field by rigorous, analytic, systematic, objective study; that we think more time and energy and devotion should be given to the field of audio-visual research; and that this illuminating research will proceed best as it is closely related to fundamental theories about communication and learning theory.

PROFESSIONALIZING THE AUDIO-VISUAL FIELD

JAMES D. FINN

The professionalization of the educational field is a concern of all educators. In this article James D. Finn has undertaken the task of presenting a framework within which audio-visual specialists can work toward such professionalization. It is the first of a series of articles by members of the DAVI Committee on Professional Education on different aspects of this problem.

Dr. Finn is Associate Professor of Education and Chairman of Audio-Visual Education at the University of Southern California. He is also Chairman of the DAVI Committee on Professional Education.

Specialization of occupation is a growing social factor in modern life. This factor is as applicable to education as to any other field. Where once there were only teachers, there are now administrators, psychologists, curriculum consultants, counselors, and many other educational specialists. Each of these specialties is developing into a profession within the general profession of education. Educators whose main responsibility lies in the preparation, distribution, and use of audio-visual materials represent another group of specialized personnel newly developed and integrated into the field of education.

In addition to the fact that people working with audio-visual materials are devoting the major share of their time to a specialized phase of education and are developing special interests, techniques, etc., there is also the fact that the audio-visual field itself is somewhat unique in that it embraces all branches of the communication arts and technology and brings new disciplines to bear upon the problems of education. This second fact makes the audio-visual field even more of a specialized educational activity than, say, the teaching of reading.

In recent years audio-visual workers have become sensitive to the professional problems of their specialty. Questions have been raised as to the possible degree of professionalization of the movement; as to what, if any, certification requirements should be set up for audio-visual directors, and as to the long-range professional objectives of associations such as the Department of Audio-Visual Instruction of the NEA (DAVI). DAVI has set up a Committee on Professional Education to study the general problem of professionalization.

It is the purpose of a series of papers, of which this is the first, to present a study of the problem of professionalization to the membership

of DAVI from the Committee on Professional Education. These papers will analyze the present status of the field to determine, if possible, the degree of professionalization that has been developed, to review the historical development of this status, and to suggest some problems that must be met and some possible solutions that might be developed in order to move the field further in the direction of a true profession.

It is hoped that these studies will stimulate the membership of DAVI and other people working in the field to undertake appropriate action. It is very significant to the Committee on Professional Education that this series of papers is inaugurated in the first issue of the new professional magazine of the Department of Audio-Visual Instruction.

Tools of a Profession

In considering the audio-visual field as a possible area of professionalization, a good place to begin is with the question: What are the characteristics of a profession?[1] A profession has, at least, these characteristics: (a) an intellectual technique, (b) an application of that technique to the practical affairs of man, (c) a period of long training necessary before entering into the profession, (d) an association of the members of the profession into a closely-knit group with a high quality of communication between members, (e) a series of standards and a statement of ethics which is enforced, and (f) an organized body of intellectual theory constantly expanding by research.

The statements identifying these characteristics need little comment. That a profession is primarily intellectual in character can be readily seen by viewing the activities of any profession; a doctor who did not reflectively think before prescribing is inconceivable. That a profession applies its knowledge directly to the benefit of man is also obvious.

The long periods of training necessary to develop specialists such as design engineers or oral surgeons are common examples of the third characteristic. Professional associations which began their evolution in the Middle Ages are a part of every civilized society. They identify the members who have successfully passed through the long training

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[1]The best quick source on the nature and development of the professions with special reference to the teaching profession may be found in Smith (16). Part Four of this volume, "The Nature and Status of the Teaching Profession," contains pertinent articles by A. M. Carr-Saunders, Abraham Flexner, A. N. Whitehead, and William O. Stanley. Many of Flexner's other works also consider this problem. See also articles relating to the professions and professionalization in the Encyclopedia of Social Sciences. A good idea of the development of a profession to a status closely resembling medicine may be obtained by studying the last four or five years of the *American Psychologist*. In this joumal reports of committees on standards, ethics, training, etc., are particularly revealing.

stage and, in fact, even control to a great degree the nature of that training. Communication between members of the profession is carried on by meetings, journals of high quality, consultations, and other means.

Architects, actuaries, engineers all have their codes of conduct or statements of ethics and various forms of standards. Coupled with this ethical formulation is a means of enforcing it in the more highly organized professions. Sometimes this enforcement responsibility rests with the professional association, sometimes with the state as a licensing body, and sometimes with both. Although there is much criticism of many professions at this point and some evidence (11) that many codes are window dressing to protect the profession from public interference and are not enforced except to the advantage of the profession as against the public, the fact remains that the idea of an ethic with the power of enforcement places a personal responsibility on each member of a profession not associated with other types of occupations.

Finally, the most fundamental and most important characteristic of a profession is that the skills involved are founded upon a body of intellectual theory and research. Furthermore, this systematic theory is constantly being expanded by research and thinking within the profession. As Whitehead says, "... the practice of a profession cannot be disjoined from its theoretical understanding or *vice versa*.... The antithesis to a profession is an avocation based upon customary activities and modified by the trial and error of individual practice. Such an avocation is a Craft...." (16:557) The difference between the bricklayer and the architect lies right here.

Professional Status of Audio-Visual Education

We can now examine the present status of audio-visual education when measured by these six tests of a profession. Are audio-visual personnel, in fact, professionals? By audio-visual personnel is meant, for the moment, those individuals who spend fifty per cent or more of their time working with audio-visual programs in schools and colleges as directors, supervisors, producers, consultants, etc., or those who engage in in-service and pre-service teacher training or research in this area.

An intellectual technique. First, the audio-visual worker does possess an intellectual technique. He has to think reflectively in such varied areas as the critical evaluation of materials, the visualization of abstract concepts, the improvement of instruction, and in many aspects of planning and administration. Audio-visual personnel, as a group, meet this criterion fairly well.

Practical application of the technique. Second, audio-visual techniques and materials justify their existence only as they become opera-

tive in classroom communication. Hence the test of practical application is completely met. Here the personnel of the field is at its best. The practical problems of classroom design, equipment, and materials are the meat and drink of most audio-visual people. As will be indicated below, there is, perhaps, even an overemphasis on this point.

Long period of training. The test of a high degree of professionalization of the audio-visual field, however, breaks down completely against the third criterion, a long period of rigorous training for the members of a profession. Most professions not only require this long period of training but are also in substantial agreement as to the nature of this training. This results in the professional associations specifying the nature of the training either through state regulation of some sort or through a system of accrediting training institutions.

The teaching profession as a whole does maintain training standards. But specific training for audio-visual directors and other personnel, with few exceptions, is still in the thinking stage. Although there have been directors of programs since before World War I, McClusky's bibliography lists only fifteen articles in the literature which discuss the requirements for audio-visual personnel (14). An examination of these articles reveals that only four are pertinent (6, 7, 12, 15). The others are devoted to administrative relationships and duties of principals, building coordinators, students, and miscellaneous problems. There has been practically no thoughtful consideration of this problem by audio-visual people and no attempt to develop standards.

The history of all professions reveals that the lengthy and rigorous training programs came after a long period of evolution. So it is not surprising to find that the audio-visual field has not made an organized effort as yet to develop such a program. The audio-visual field has developed rapidly and has surmounted many professional problems without showing all the required characteristics of a profession. Now, in 1953, the field is really, for the first time, in a position to take a good look at the problem of professional training. The State of Indiana has already taken action, and proposals have been published in other states as to the training necessary for an audio-visual director and pointing to some form of certification. The Committee on Professional Education of DAVI has this as one of its direct concerns.

The nature and content of professional education for audio-visual directors and other workers presents many problems that must be solved before audio-visual education can claim the status of a profession. The system of apprenticeship training that has been in operation is no longer adequate. Trained audio-visual personnel will not stay in their present jobs forever, and there is no longer the reservoir of service-experienced people to draw upon. Obviously, a graduate program that can provide the

competencies generated by service and industrial experience coupled with a better theoretical background is required immediately. The audio-visual field cannot be upgraded into a profession until this occurs. Other unsolved problems include the nature of certification standards, admission standards and practices, and placement.

Association and communication between members. The fourth criterion of a profession—a closely-knit association with a high quality of communication between members—is another point at which the audio-visual field does not measure up. Considering, first, professional association, the best that can be said at present is that a professional association is in the process of *becoming* and will someday emerge.

For many years DAVI was a comparatively weak organization held together by a small group of stalwarts. DAVI went through several reorganizations and managed to survive a depression and a war, but only in the last two or three years has the organization shown anything like the potential it can develop. The present arrangement which ties in the organization with the NEA through its executive secretary, with working national committees dealing with important problems, and with an increasing and interested membership promises much for the future.

The audio-visual field has also suffered from too many organizations. It is a moot question whether the organizations which represent special applications of the field such as The Association for Education by Radio-Television (AERT), the Educational Film Library Association (EFLA), and the Film Council of America (FCA) should remain outside of the main stream of the DAVI or become divisions within it in order to develop the best possible organization for the profession. The men and women who founded and carried on these organizations deserve nothing but commendation for their continual struggle and achievements, but the field as a profession would probably benefit more by merger than by continued separatism. At least this possibility should be thoroughly explored.

At the state and local levels, the structure of audio-visual organization has not yet even approached the professional. There are some fine state units, to be sure. The Audio-Visual Education Association of California, one of the oldest and strongest, is a professional organization in every sense of the word. AVID of Indiana has achieved national recognition, and AVDO of Ohio is rapidly growing in strength. And there are others. But much work remains to be done on the state and local levels.

It is at the other half of the concept of association—the idea of a high quality of communication between members—that the audio-visual movement as a whole had failed until the decision was made to publish the journal in which this paper appears. With the exception of Edgar Dale's *Newsletter,* all of the journals serving the field had difficulty

presenting professional content. This was true of *Educational Screen, Audio-Visual World, See and Hear, Audio-Visual Guide, Business Screen, The Journal of the AERT, Film News,* and all the rest. Most of the time these magazines were not able to print thorough and scholarly papers on the theoretical bases of audio-visual education; research studies for the most part were ignored and left to journals outside the field. When compared to the *Psychological Review, The American Journal of Sociology,* or a hundred other professional periodicals, the audio-visual magazines have simply not measured up professionally. There were good and sufficient reasons for this, but the fact remains.

This is not to say that these other audio-visual journals have failed to contribute as the audio-visual field struggled through its infancy. They have done their share in developing the field. In particular, Nelson Greene made a great contribution through the years with the *Educational Screen.* Greene was a scholar and had an intensive interest in professionalizing audio-visual education. Some examples of this interest were the publication of Krows' somewhat dull but important account of the development of the non-theatrical film, carried serially over two years; David Goodman's abortive column on research abstracts; and an attempt to carry a column which critically reviewed the literature of the field.

In general, the journals until now have made a contribution by carrying information on materials and equipment, occasionally publishing an article of professional merit, and everlastingly promoting and crusading for things audio-visual. This is a sign of the childhood and adolescence of the audio-visual movement. Audio-visual education is here to stay. Promotion and professionalization, while both are necessary, are not the same things. The time has come to add the dimension of professional content to the field's journals and it is hoped that the *Audio-Visual Communication Review* will fill the gap.

Professional communication is also carried on in meetings and conferences. The same criticisms leveled at the quality of the journals can apply to the quality of most audio-visual meetings. The meeting agenda seem to be of two types. One is a type designed to appeal to the practicing teacher and consists of a rehash of one or more chapters of Dale, Hoban, or Kinder carried on for two or three days! To the audio-visual professional, this type of meeting is about as intellectually stimulating as a plateful of unsalted grits would be to Oscar of the Waldorf. The other type appeals to the ever-present gadgeteer in audio-visual circles and, while it may not be concerned any more with the "F-value" of lenses, the topics have merely changed to more efficient booking forms, the JAN projector, or the heat and pressure necessary to laminate a 20 × 24 print.

The writer is not arguing for the elimination of meetings designed primarily for teachers nor for the abolishing of the technical problems

of the audio-visual field from consideration. Certainly thousands of teachers need help with the elementary concepts of audio-visual instruction;[2] certainly the audio-visual field will always be plagued with technical problems which must be solved. But professional meetings are not professional meetings if they are limited to these two areas. The first can be best dealt with in regular gatherings of teachers rather than at audio-visual meetings, and the second area should be reduced to a section or two of professional audio-visual conferences to restore perspective.

Again, improvement in recent years has been noted. The agenda for the Boston and St. Louis meetings of DAVI showed many signs of professionalization not present at earlier meetings. Many state meetings have been improving programs. Nevertheless, the improvement of audio-visual conferences has a long way to go.

In summary, then, to achieve a real professional status, the audio-visual movement needs to develop a strong and creative association at the national and state and local levels; it needs to develop true professional journals, and it needs to improve conferences and meetings. When these things are done, audio-visual personnel can say they have met the requirements of the fourth criterion—the criterion of association and communication.

Code of ethics and standards. The fifth measuring point, ethics, standards and their enforcement, is a function of the fourth, a strong association. Statements of ethics and publications of standards are developed by professional associations. Audio-visual personnel, as members of the teacher profession, are subject to the ethics of the profession. As yet, nothing has been done to develop a separate code of ethics for the audio-visual movement.

In the field of standards, there are signs that professionalization is under way. The Committee on Buildings and Equipment of DAVI is studying standards in its field, and has produced an excellent publication. (17)

However, the publication of codes of ethics and manuals of standards in itself guarantees nothing. Professionalization occurs when enforcement is possible and vigorous. Thus, the American Medical Association wages war on quacks and malpractice; engineers and architects write building standards into the law, and the courts can disbar a lawyer for illegal practice.

Enforcement is closely tied in with admission to the profession by a licensing system (a function of criterion three—training), with placement which assures that licensed personnel are hired, and, most fundamentally,

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[2]See, for example, the recording: Edgar Dale and James D. Finn, "The Improvement of Teaching Through Audio-Visual Materials," Educational Recording Services, Los Angeles, 1951, an aid for teachers' meetings, illustrating the position of the writer on this point.

with an obligation on the part of each professional to the ethics and standards of his profession.

In view of the fact that the entire education profession has not met this criterion to the degree that the other professions have, it is questionable whether the audio-visual group will ever completely measure up to this point. And it is even questionable whether such a rigorous arrangement is either necessary or desirable. However, the audio-visual movement will at least have to reach the stage where it has a well-defined code of ethics, a series of standards based upon fundamental research, and a form of certification somewhat related to them. At the moment the field is not at this stage and does not meet criterion five.

Intellectual theory and research. As was indicated in the introductory phase of this paper, the most important characteristic of a profession was the sixth and last, that the technique of a profession is founded upon a body of systematic theory and research constantly being expanded by research and thinking within the profession. When the audio-visual field is measured against this characteristic, again the conclusion must be reached that professional status has not been attained.

Audio-visual workers have put a premium on "practicality" and have been criticized for this by colleagues within the field of education and by the *literati* from without. There is some merit to this criticism. For years, even at audio-visual meetings, someone has always been taking cracks at the "gadgeteers." As the writer has indicated above, it is his position that the audio-visual field is a result of the fruits of technology applied to the educational process and a certain amount of gadgeteering will always be necessary. Too much, however, reveals a poverty of thought.

The audio-visual field has never been too clear on the point that theory and practice must constantly interact in any intellectual activity of man. In line with some other mistaken educators, many audio-visual people have insisted that they want to be "practical" and not "theoretical," and that "experience" is the thing. This is, in part, an honest reaction against an older viewpoint that placed theory up somewhere near the Milky Way where it had no relation to practice except to cause aesthetic chills to chase up the spine of some professor.

This attitude, however, also represents a complete misunderstanding of the nature of reflective thinking, scientific progress, and the wellsprings of human behavior. As Dewey (4) has said, "...we find that experience when it is experimental does not signify the absence of large and far-reaching ideas and purposes. It is dependent upon them at every point." Without these large and far-reaching ideas any field, and this is particularly true of the audio-visual field, can go only so far and then has to stop.

Many of the criticisms listed above, lack of content at meetings, journals with little intellectual meat, etc., are merely symptoms of this greater trouble—lack of theoretical direction. Without a theory which produces hypotheses for research, there can be no expanding of knowledge and technique. And without a constant attempt to assess practice so that the theoretical implications may be teased out, there can be no assurance that we will ever have a theory or that our practice will make sense.

The audio-visual movement is new and growing, but it is in danger of becoming stunted if it is left to its present theoretical formulations. The present theory guiding the movement can be summed up in three references (2, 8, 10). The basic concept around which all three have oriented is the notion of the concrete-abstract relationship in learning. This is perhaps most thoroughly explored in Hoban. Dale adds material on retention and forgetting with a brief historical section, and Kinder expands to a very short history of communication and deals slightly with perception and imagery. All also emphasize the gamut of materials approach to learning, the concept of utilization, the experience theory of learning, and the strengths and weaknesses of the various aids.

The remainder of audio-visual theory is scattered throughout the literature. McClusky (13) has related audio-visual techniques to learning theory in a somewhat unique fashion; Brooker (1) began a line of thinking of promise in his discussion of communication which remains to be explored; Exton's (5) contribution of the concept of "optimum synthesis" has not received the attention it merits. All of these are but examples of the scattering of notions throughout audio-visual literature which, when brought together, might constitute a beginning of a fruitful theory.

To these examples, of course, much more would have to be added: most of the writings of Hoban, many of Dale's essays in the *Newsletter*, reports on the proceedings of conferences, generalizations derived from successful practice, generalizations derived from research, etc. The audio-visual field cannot rest its theoretical formulation on the contents of several textbooks designed for teacher training that do not include even all the useful theory to be found in audio-visual literature.

Because of the nature of the audio-visual field, however, useful theory is not confined to its own literature. As most workers realize, there is a literature of the film, of photography, of the museum, of dramatization, etc.; there is also the literature of educational method and curriculum; there is the literature of educational psychology, of social psychology, of social anthropology; there is the literature of art and design; finally and perhaps most important, there is the growing literature of communication. In fact, research and thinking in some parts of the

physical sciences (neurology, physiology, acoustics, etc.), the social sciences (social communication and control, learning theory, etc.), and the humanities (art, music, etc.) are each pertinent to the field. We need to understand the filmic expression ideas of Slavko Vorkapich, the visual experiments of Samuel Renshaw, and the communication philosophy of Susanne Langer.

Viewed in this light, most people in the audio-visual field are still guided by a theory which is fragmentary; theory as now guiding the field (the generalizations held by many of the workers) is not even inclusive of the notions contained in audio-visual literature; it has never worked in most of the pertinent generalizations available from outside these narrow limits.

On the important test of theory the audio-visual field does not meet professional standards. Its workers are craftsmen, not professionals, in the majority of instances because they are operating, in Whitehead's words, on "customary activities modified by the trial and error of individual practice." Absolutely fundamental to the development of audio-visual education as a profession in the sense that DAVI is now using the term is the prior development of an all-inclusive body of theory upon which to assess and guide practice and base research. Once this is done, many of the other criticisms stated above will no longer be valid because their source will have disappeared.

The status of audio-visual research also reflects on professionalization. Not that research does not exist or that it is not being pursued. A recent bibliography (3) lists 163 titles through 1946, and this is by no means all-inclusive. Because of the journal policy discussed above, research pertinent to audio-visual education is published throughout the literature of the social sciences and needs a staff of detectives to trace it down. Very little of it has been reported in audio-visual meetings. This means that many audio-visual workers must be "flying blind"—a black mark for professionalization.

The post-war years have brought an increase in research activities in audio-visual education and related areas. Much of this research is government sponsored and financed, but it is being published in pamphlet form, in psychological journals, or in other places more or less inaccessible to the practicing worker in the audio-visual field. A true profession, such as medicine, makes this information more easily available to its practitioners. Furthermore, outside of the volume by Hoban and Van Ormer (9), there is not much evidence that research is influencing the formulation of theory. Many of the hypotheses now being tested have been derived from learning theory and the "social perception" theories which have been developed by a number of social psychologists. *The audio-visual field is in the peculiar position of having much of its research*

carried on by workers in other disciplines using hypotheses unknown to many audio-visual workers, and reporting results in journals that audio-visual people do not read and at meetings that audio-visual people do not attend. While the research is expanding the intellectual background of the profession it seems to be having little effect. A tremendous amount of integration is necessary before this part of the criterion six can be met.

Summary

In summary, then, of the six criteria set forth in this paper: (a) intellectual technique, (b) application of technique to practice, (c) long training period, (d) association of members with a high quality of communication, (e) a series of standards and an enforced statement of ethics, and (f) an organized body of intellectual theory constantly expanding by research, audio-visual personnel meet only the first and second completely. The fourth and fifth are met to a degree which is not satisfactory but which is improving. And the third and sixth tests rate such low scores that failure is the only possible grade. This adds up, in the opinion of the writer, to the simply stated fact that *the audio-visual field is not yet a profession.*

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PERCEPTION RESEARCH AND AUDIO-VISUAL EDUCATION

KENNETH NORBERG

The experiments in perception are assuming greater importance to audio-visual educators. Dr. Norberg briefly summarizes the demonstrations at the Hanover Institute and points out their implications for audio-visual instruction. Some challenging questions regarding "concrete" and "abstract" learning are raised.

The author was Director of the Audio-Visual Center, University of Chicago, when this paper was written. He is now Associate Professor of Education and Coordinator of Audio-Visual Services, Sacramento State College, California.

Psychological research in the field of perception is obviously of great importance to the scientific development and use of visual materials in education. Visual education rests upon the assumption that people learn from what they see, that visual experience influences behavior, and that instruction can be improved by enabling people to look at objects and pictures under appropriate circumstances, and in connection with other varieties of experience. We have experimental evidence to show that broadening the base of perceptual experience improves learning. Why this is so can perhaps be explained, crudely, although we are frequently inclined to take it for granted. But we still have much to learn before visual presentations can be used as precision tools in communication and teaching. In order to gain a better understanding of visual education we must first know what happens when we perceive.

Perhaps at no time in the past have psychologists shown greater and more wide-spread interest in the problem of perception. Much experimental work is going on, and along with it, much discussion of the theoretical issues involved. Various approaches and lines of development are represented. Experimental psychologists still support a constant line of interest in the physiological aspect of perception, but a recent and prominent trend seems to be toward an emphasis on a broader construction in which perception is viewed as an aspect of the total behavior of man in the course of purposeful action. One interesting and widely noted example of the broader approach to perception is the development centering in the work of the Hanover Institute and the well-known demonstrations which have grown out of the earlier experimentation of the Dart-

mouth Eye Institute. The Hanover Institute is located at Hanover, New Hampshire. Adelbert Ames, Jr., is the director.

It is the purpose of this article to discuss the Hanover Institute demonstrations in perception with regard to possible implications for audio-visual research. In this brief analysis we shall rely mainly on the reports and interpretative writings of a small cluster of men including Adelbert Ames, Jr., Hadley Cantril, Merle Lawrence, Earl C. Kelley, and Ross L. Mooney. These sources have been selected and used either because they were directly instrumental in the development of the demonstrations, or have been actively concerned in their interpretation and/or educational use.

Because the Hanover Institute experiments have already been widely reported there will be no attempt to present a comprehensive description here. Instead, we shall describe very briefly a few representative demonstrations, mainly for purposes of orientation, and then proceed to the interpretation.

The "Chair" Demonstration

The subject looks through a peep-hole in each of three different screens, "A," "B," and "C." Behind each of the screens he sees a chair, or what appears to be one. It is noted that behind each of the three screens the observer sees an upright chair at a specific distance, of a specific size, three-dimensional in form, with legs parallel and at right angles to the seat. Now, if the observer looks behind screen "A" he will find strings arranged to give an outline of a chair. Behind screen "B" he will see a number of disconnected strings of different lengths and at different angles. Behind screen "C" he will see strings in a plane which constitutes a perspective projection of a chair-shaped object. What one sees if he looks behind each screen (what is "actually there") is quite different from what he sees as he looks through the several peep-holes. (See Figure 1)

Now, it should be noted that the Hanover Institute demonstrations are not merely experiments, in the usual sense. They are actually demonstrations designed to bring out facts of perception, and to interpret and relate these facts in a gradually developing theoretical structure. In the case of each demonstration an interpretation is offered, and the interpretations of the several demonstrations are fitted together in the cumulative development and elaboration of a theory of the nature of perception.

In the case of the "chair" demonstration the interpretations offered in the manuals and other writings connected with the Hanover Institute point out that the characteristics and qualities of the "chair" behind each of the three screens are obviously not in the object, itself, i.e., the arrangement of strings. The same stimulus pattern, or retinal

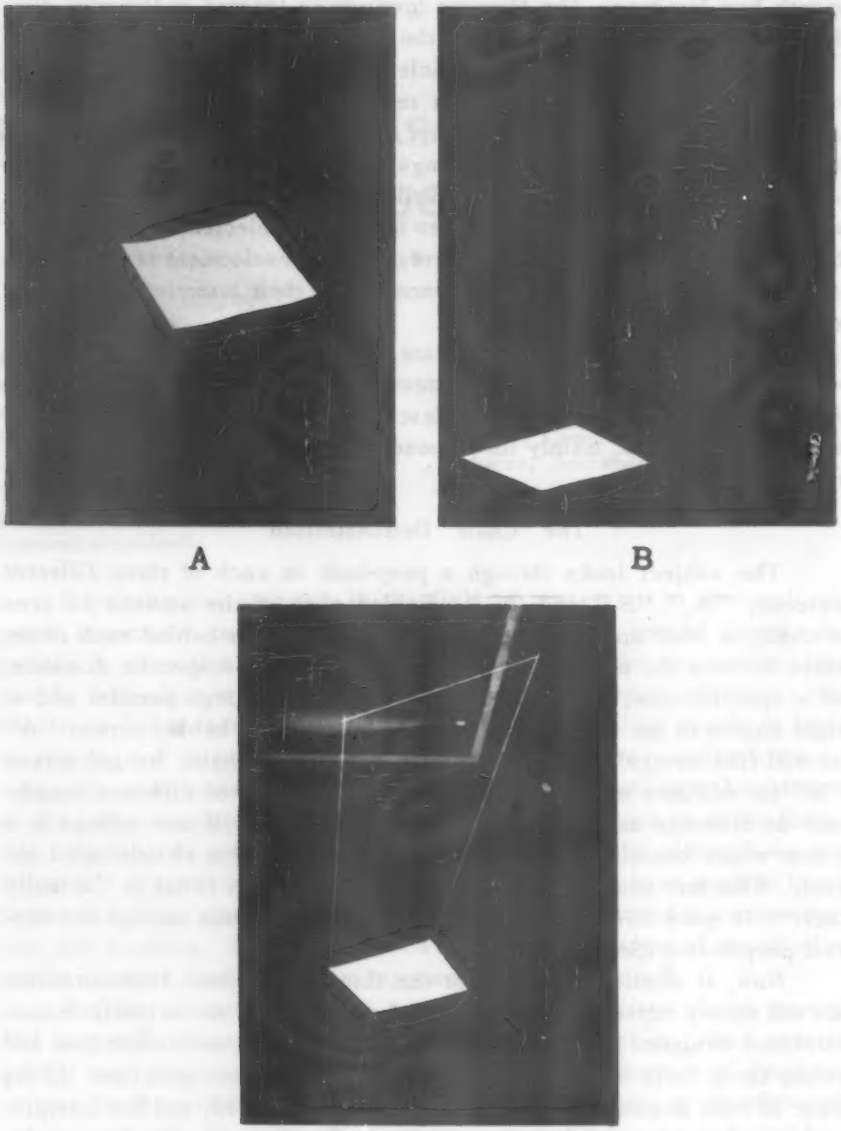


FIGURE 1[1]

[1]All illustrations are from Franklin P. Kilpatrick, Editor, *Human Behavior from the Transactional Point of View*, Institute for Associated Research, Hanover, New Hampshire, 1952.

image, may be produced by any one of an infinity of external conditions. Moreover, what is perceived, or seen, is not determined by the physiological stimulus pattern. Two conclusions are drawn: (a) The characteristics and qualities of things seen cannot be derived from the immediate outside world. (b) They cannot be derived from immediate physiological stimulus patterns. "This means, then, that the explanation of the nature of sensations must be looked for in the prior events that are related to the immediate events." (8)

The Star-Point Demonstrations

In a completely dark room two star-points are viewed from a stationary position. These illuminated points are the same distance from the observer. One point is brighter. It appears to be nearer. The interpretation is that under these conditions the observer "assumes" the star-points to be identical and interprets the difference in brightness as a difference in distance from him.

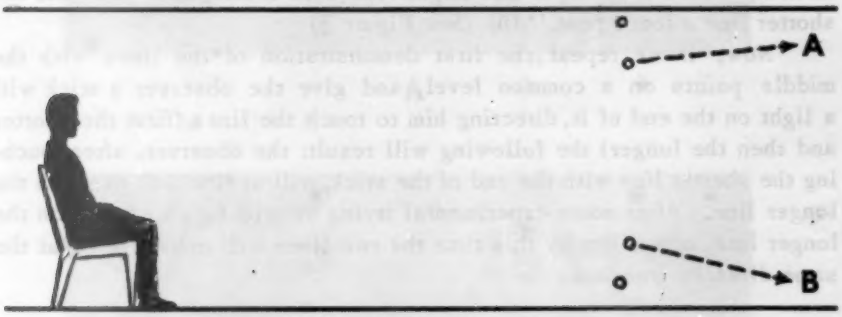


FIGURE 2

In another demonstration the observer looks down (at an angle) at two star-points of equal brightness, one vertically above the other. The observer senses the upper point as farther away. If the situation is reversed so that the observer looks up at two points, the lower point will appear farther away. "The apparent explanation of this phenomenon is that when we look down there is a probability that objects in the upper part of the field are farther away than objects in the lower part. When we look up, the opposite is true." (8) (See Figure 2)

Demonstration with Lines

In a darkened room two vertical lines of different length, at the same distance from the observer, appear as though the shorter line were farther away, if the lines are positioned so that their middle points are on a level. However, if the shorter line is arranged below the longer one, it will appear closer. "The apparent explanation of this phenomenon is that in the

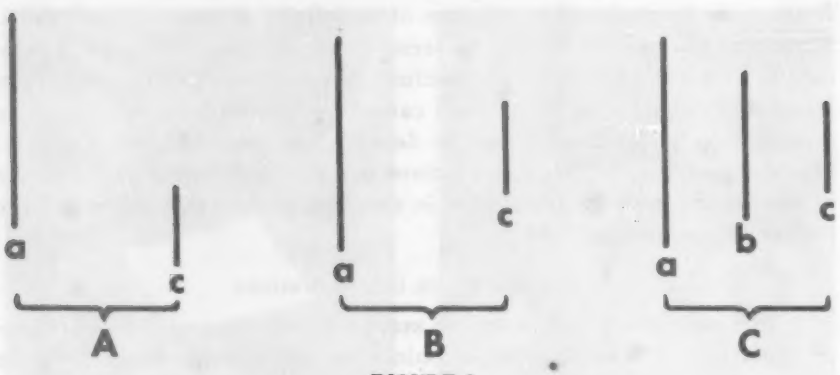


FIGURE 3

first relationship there is a greater probability that the two lines might represent identical things, e.g., telegraph poles, than in the second relationship where the longer line might represent a telephone pole and the shorter line a fence post." (8) (See Figure 3)

Now, if we repeat the first demonstration of the lines with the middle points on a common level, and give the observer a stick with a light on the end of it, directing him to touch the lines (first the shorter and then the longer) the following will result: the observer, after touching the shorter line with the end of the stick, will at first fail to touch the longer line. After some experimental trying he will be able to touch the longer line, also. But by this time the two lines will appear to be at the same distance from him.

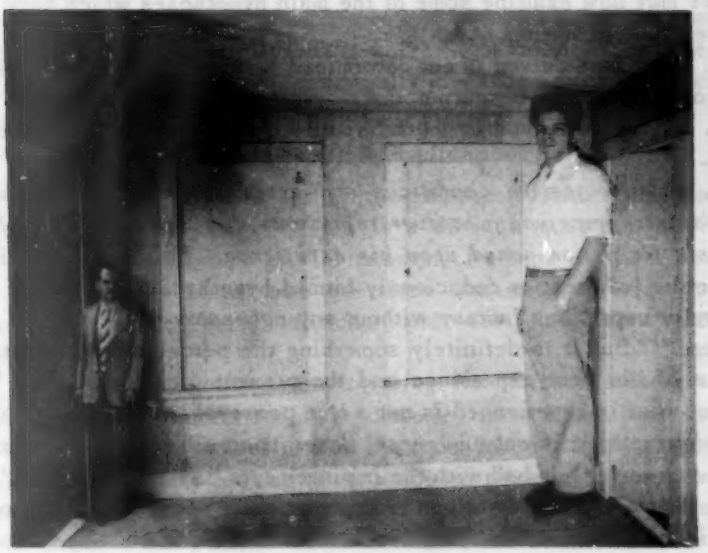
The Distorted Room Demonstration

A distorted room is so designed that when it is viewed with one eye through a hole at a certain position in a screen the room appears rectangular and normal. (Even if the observer has already looked behind the screen and knows the room is distorted, it will still look like an ordinary room when he views it with one eye, through the screen.) (See Figure 4)

Now, if the observer takes a stick and tries to touch a ball in the upper left hand corner of the room after touching a ball in the upper right hand corner, he will be unable to do it, at first. After repeated tries he may become fairly successful in touching both balls. As this occurs *the appearance of the room will change.*

General Interpretation of the Demonstrations

Many of the Hanover Institute demonstrations have not been mentioned here. However, with this very brief introduction to the demonstra-



A

B

FIGURE 4

tions we may now examine some of the main hypotheses which have been advanced in explanation.

1. What is perceived is not determined by objective or environmental conditions, in their own right.

2. What is perceived is not determined by the physiological stimulus pattern.

3. *Given objective conditions and associated retinal stimulation, the observer perceives whatever represents, for him, the most likely prognosis for action based upon his experience.* This prognosis is not a deliberate judgment or consciously formed hypothesis. Neither is it an arbitrary or capricious fantasy without any necessary connection to what is "there." But it is definitely something the perceiver makes for himself out of his past experience and the present circumstances. "The nature of what is experienced is not a true portrayal of the existing physical environment; it is only a 'guess' based upon all the previous experience the observer has had with the impingements he has confronted." (6)

4. What the observer brings to any particular occasion by way of his perceptions reflects an "assumptive form world" (1, 3) built up out of his past experiences. This "assumptive form world" is modified as the prognoses or predictions which we call perceptions are acted upon, and thereby tested.

5. To understand perception we must look upon human behavior as a "transaction" (4) in which neither the individual nor the environment is regarded as an independent entity merely affecting or conditioning the other.

The functional character of perception which is brought out in the preceding statements is emphasized in the following definition of perception given by Cantril:

> On the basis of the demonstrations, not to mention everyday life observations, we may define a perception as an implicit awareness of the probable consequences an action might have for us with respect to carrying out some purpose that might have value for us. Perceptions are conceived and given birth to in purposeful action that results from value-judgments. And for whatever reason a perception may return to consciousness, it has in it implicitly the factors of action, purpose, and awareness of value. (2)

Thus, at some risk of over-simplification we might sum up by saying that the theory of perception developed in connection with the Hanover Institute demonstrations insists first of all that perceiving be considered always in the context of purposeful behavior, and that the question "what is perceived?" must be answered as a directive for action reflecting some set of assumptions as to what will happen if such and such actions are carried out. Our perceivings are not merely guides

for actions, or invitations; they are essentially phases of purposeful action, itself. They have various degrees of reliability, but they are never direct copies of some "reality" which is merely and independently "there." Hence, they are essentially dynamic attitudes in constant change.

Some Possible Implications

What are the implications of the Hanover Institute demonstrations for audio-visual education? This is a difficult question, and we will only attempt to suggest a partial answer. Perhaps the best answer, at this time, is to indicate some questions that seem to arise out of the Hanover Institute demonstrations and the associated theoretical development.

1. *Can we actually learn anything from visual presentations as such?* In the demonstration of the distorted room it has been noted that the observer can never get to see the room in its "true" shape just by looking at it. Merely looking, from a constant position, changes nothing —results in no change in perception, no learning. It is only when the observer changes his position of observation, looks behind the screen, or attempts to manipulate objects inside the room that some learning (involving change in perception) results. In more general terms, this would seem to mean that we do not learn by merely seeing, but in the action, or course of action, in which seeing is involved. (It should be added that this would not rule out learning *at the time* of visual presentation, nor the possibility that an appropriate visual cue might be critical to the carrying out of some action, or course of action, from which learning occurs.)

Of course, if the generalization just given follows from the demonstration of the distorted room, we would have to inquire what happens when something more than a single static perception is involved. True, nothing can be learned if we continue to stare at the room from a fixed perspective; we must actively explore the situation to gain new understanding. But what if we substitute for direct and active exploration a series of still pictures taken from different points of view? In this case behavior is still limited to merely "seeing" but it is apparent that some learning—some progressive change in understanding—might occur anyway. This is not difficult to explain, nor does it seem to contradict our generalization that merely looking at something does not constitute a learning experience. Would it be appropriate to say that we learn from a "look" at something only when this "look" stands in a *series* of experiences linked together in a course of purposeful action? This would take into account the fact that perception, itself, is a form of action, and that experiences that are primarily, or merely, visual, may (and very frequently do) assume critical value in carrying forward a line of purposeful

action which results in learning. To say that learning may result from a visual presentation, as such, seems consistent with the Hanover Institute demonstrations *if* we include the presentation in question in a time-series of other experiences (not necessarily or exclusively visual), in which case we assign the learning effect to the series, primarily, and to the specific visual presentation only in so far as it represents a genuine link or culmination of that series.

2. *Is perception a cause of learning, or a dimension of the learning process?* This question is really a corollary to the first question, The Hanover Institute demonstrations bear out the thesis that our perceptions are learned. They are *results* of past experiences and present concerns. This, of course, does not rule out perception as a causal factor in learning, but it does suggest that we should not think of perception *merely* as cause, *nor* merely as a result of learning. The Hanover Institute demonstrations help to remind us that learning occurs in the course of purposeful action, involving the full range of behavior, over time.

It is probably more accurate and more fruitful to think of perception as an aspect or as a *dimension* of the learning process than merely as a "cause." A simple example may help to illustrate the point. Every child learns in due course of time that certain objects are dogs. This ordinary learning process involves a series of experiences during which certain sensory-motor, lingual, emotional, and other responses are developed. During the same series of experiences the child learns to perceive and to deal with certain external events as dogs. The child does not first perceive dogs and then learn to deal with dogs, or talk about them, although he may have crude perceptions of moving things, or animals-of-some-sort, prior to perceptions of dogs in a full and meaningful sense. The development of the perception is actually concurrent with the development of the interrelated motor habits, emotions, thinking, and talking that adds up to the "dog" behavior of the child. It is evident that children would not learn about dogs without sensory contacts with this animal. But what is more important is that there must be a *continuity* of perceptional experiences over time, during which there is constant interplay of sensory experience with the full range of other factors or "levels" of experience.

The implications for audio-visual research and theoretical development should be obvious.

3. *Are our visual perceptions of things more concrete than words?* Our "common sense" tells us our perceptions, including presentations of objects and events, come closer to the "concrete" than words. The Hanover Institute demonstrations seem to throw some doubt on this assumption. (Actually, a simple logical analysis reveals that words, *in general,* can hardly be regarded as less concrete than visual perceptions *in general.*) The theory growing out of the Hanover Institute demonstra-

tions holds that every perception is a kind of summing up, a "weighted average," (3) of the meanings of a vast number of particular sensory impingements, or stimulus-patterns, so that what we perceive at any given moment is not just a "concrete" object, in the sense of an independently existing thing, "out there," but a meaning which we derive from the past as appropriate to the present situation. In this sense, every perception is a kind of abstraction: a *pulling out* from the available fund of past experiences (the "assumptive form world") the "weighted average" meaning which represents the present "hypothesis" for action.

Now if perception is regarded in this way, it would appear that the differences between perceptions and words, as viewed by "common sense," should be reconsidered. Ross L. Mooney has commented on this problem as follows:

> We are quite likely to assume that words and perceptions are two quite different sorts of things. However, it becomes quite clear, when we stop to think about it, that words and perceptions are the same kind of phenomena. Indeed, words are perceptions.
>
> When we hear a spoken word, our ears are receiving sound waves; when we see a written word, our eyes are receiving light rays. As children, we come to know the "meaning" of a spoken word with the same operations we use to come to know the "meaning" of a squeaking door, a barking dog, or a clap of thunder. Similarly, we come to know the "meaning" of a written word with the same operations we use to come to know the "meaning" of a red ball, a square room, or a moving human figure. (7, p. 9)

This seems to outline a significant attitude to be taken into account by audio-visual specialists and research workers when dealing with the differences between visual and verbal methods of presentation. If words and perceptions are regarded as the same kind of psychological phenomena, it would follow that we must be careful in making any general assumptions about their relative abstractness or concreteness. It may be that all perceptions, including those we call "words," involve abstraction. Also, it may be that certain levels or kinds of abstractions necessarily involve lingual expression. But it seems overly crude, and possibly misleading, to generalize that perceptions (in the limited sense) are necessarily "concrete" as opposed to words. This is a highly complex problem which cannot be discussed in the limited space available here. However, it might be noted that so long as perceptions are regarded as yielding only prognoses for action they can hardly be regarded as providing the ultimate grasp which is considered to be the concrete object. In this sense, the concrete always lies one step beyond perception. It is not the object of present perception, and can be realized only by reconstruction of some event that has already occurred in the past.

4. *What are some of the larger implications of the Hanover Institute demonstrations?* One of the most striking features of the theoretical discussion growing out of the work of the Hanover Institute is the em-

phasis on wider application of the principles (hypotheses) revealed by the demonstrations. It is clear that those who have been associated with the Hanover demonstrations think of perception in very broad terms, and feel that the implications of the experiments cannot be limited to some range of experience regarded as merely or purely sensory in character. Cantril, for instance, points out that our social perceptions are governed by certain requirements brought out in the demonstrations, and his whole discussion of social perceptions in *The Why of Man's Experience* seems to reflect the assumption that the attitudes involved in social behavior can be interpreted along lines suggested by the demonstrations (3). The same general approach is observed in Earl C. Kelley's book, *Education for What is Real,* which deals specifically with the educational implications of the Hanover Institute demonstrations. The more general implications of the demonstrations are also mentioned by John Dewey in the foreword to Kelley's book.

> ...There has been developed an experimental demonstration of the principles which govern the development of perceiving, principles which are formed, moreover to operate more deeply in the basic growth of human beings in their distinctive human capacity than any which have been previously laid bare. (5)

Thus we are reminded that perception, in this general framework of interpretation, cuts across the entire range of human behavior including the social and the symbolic, that the story of our developing perceptions is also the story of learning. We are reminded that perception is never merely an appeal to the senses, while at the same time the effective engagement of the learner in lines of continuous action, by which his perceptions are changed and enriched, calls for an optimum level of carefully selected sensory contacts with whatever is pertinent to his developing purposes and interests.

The implications for audio-visual research and practice should not be too obscure. These seem to be some of them: We cannot say what an individual will learn from any discrete visual presentation, as such, and aside from a context of other experiences, in time. Learning results from a *series* of purposeful acts carried out with continuity of purpose and direction. All action is not overt or "physical," but to maintain and carry forward a line of purposeful action, in time, requires adequate conditions of sensory contact with the environment. We learn *from* visual presentations in so far as they make it possible, or easier, for us to carry out our purposes. As we learn *from* perceptions, and *to* new ways of perceiving things, our "assumptive form" world changes and this involves the most complex organizations of our behavior including social attitudes and conceptions.

We cannot learn without acting. We cannot act without perceiving.

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DETERMINANTS OF AUDIENCE REACTION TO A TRAINING FILM

CHARLES F. HOBAN

This exploratory study by Charles F. Hoban raises two challenging and unique hypotheses. Whereas, in the past, we have been inclined to consider audience involvement in an instructional film as a function of audience *status* at the time, this experiment presents evidence that points to audience *aspiration* as the determining factor.

Dr. Hoban, previously at Catholic University and in the Army Pictorial Service Division, is now associated with the University of Pennsylvania.

Audience reaction to instructional films is a difficult and complicated problem. Take one broad facet of the problem. We use the term *film* as if all films and all reactions to films were much the same. An audience seldom reacts to a film in this abstract sense. It reacts to a specific film. In a specific film, there is a specific informational content, in the usual meaning of film content, and a specific story treatment of this content. Story treatment is also an informational content of the film to which the audience reacts—an important fact the implications of which are easily overlooked.

Take another facet of the problem: An audience viewing the information recorded in a film in a different context of usefulness of the recorded information. The possibility that the viewing situation may influence audience reaction is recognized in the abstract, but the determinants of the difference in reaction due to viewing situation are relatively unknown.

Studies of effect of viewing situation on audience reactions have dealt with such variables as auditorium *vs.* classroom showings, room illumination, and viewing angle and distance from the screen. As indicated in Gibson's studies (1) matching problems such as these are not as critical as often supposed. Given minimum standards of visibility, room illumination and viewing angle and distance from the screen do not register as important variables when measured in terms of learning and testing outcomes.

Problems of auditorium *vs.* classroom film showings are of a different order of importance. Unfortunately, the design of film-learning experiments in terms of physical variables tends to obscure the psychological dimensions of the viewing situation. Results of the Knowlton and Tilton (4) and the Krasker (5) studies, reviewed elsewhere (3), did not firmly establish the physical viewing situation as a determinant

of audience response, although it was evident in these two studies that some variable was operative in affecting audience response.

Some data on the effect of viewing situation on audience involvement and identification were gathered in the course of field testing a training film. It is my purpose to report these data and to formulate hypotheses on audience involvement and audience identification in instructional film presentation. In the course of this report it will become evident that the advice of Elton Mayo (6:xvi) in regard to industrial cooperation is equally apropos to audio-visual communication: "There is no 'ism' that will help us to solution; we must be content to return to patient, pedestrian work at the wholly neglected problem of the determinants...."

Learning-by-Example from a Film

The data come from a study of audience reaction to *TF 11-1752 How to Operate the Army 16mm Sound Projector Set.* This film was produced in 1952 by the Signal Corps Photographic Center for use in Army projectionist training courses. It deals with the operation and preventive maintenance of the JAN (Joint Army-Navy) projector set, developed by the DeVry Corporation under contract with the military establishment, and standardized by the Army and Navy Departments for procurement and issue.

In the production of the film, attempt was made to minimize the information transmitted in the film and to maximize the learning outcomes from its exhibition. Detailed description of story and studio techniques is available elsewhere (2). In essence, all visual information on context of action (sets) was eliminated as unessential, although relevant to the learning task.

The story treatment of the film is dramatic. In this general sense, the film is representative of story treatment increasingly used in instructional films. Dramatic treatment of information to be transmitted by a film is closely tied in with learning-by-example. In dramatization, characters are used. When characters are used in an instructional film, they are cast in the role of *models*. The assumption is that the audience learns-by-example, that the example is set by the models in the film, that the audience identifies with the models and learns by the example set by the models.

This rationale points up one of the basic characteristics of an instructional film. Whereas the entertainment film is intended to be viewed as social fantasy, the instructional film is intended to be viewed as social reality. To the extent that the model with which the audience identifies in the social fantasy of "the movies" carries over in the

audience as a model in social reality, the entertainment film is no longer simply entertaining; it is educational.

To the extent that an audience does not identify with the model is an instructional film, application of the theory of learning-by-example is invalidated. In consequence, the educational potential of the film is reduced.[1] In this event, the chances are that the film is neither the best education nor the best entertainment. It is understood, of course, that identification may be positive or negative, that both the "goodie" and the "baddie" are models with which identification may be positive or negative.

Models in the Film

When a character is cast in the role of a model in an instructional film, the character is cast as "the person whose behavior provides example for learning." This is LaPiere and Farnsworth's (7:123) sociological definition of a model.

Two main characters carry the action of the film on operation of the Army projector: (a) Jim, a soldier enrolled in an Army projectionist training course, shown practicing on the projector set in off-duty times; (b) an off-stage expert on projector operation and maintenance, heard but never seen by the film audience. Throughout the film the off-stage voice frequently interrupts the trainee, asks questions, cautions against mistakes, warns of their consequences, and occasionally explains fine points of projector performance. Jim is cast in the role of a model of a *trainee* learning to operate the projector set. The off-stage voice is cast in the role of a model of the *expert* in projector operation.

Design of Preliminary Study

For a number of reasons we need not enumerate here, it was desirable that this film, *TF 11-1752,* be field tested. The field test was undertaken by the Army Pictorial Service Division, Office of the Chief Signal Officer.[2] The data reported here were gathered in the course of preliminary testing an audience reaction questionnaire for use in the

[1]This does not imply that no learning takes place from a film if the audience does not identify with the models. Without this identification, the information transmitted by the behavior of the model *as a model* is filtered out by the audience, and, hence, has the characteristic of noise. Noise diminishes the efficiency of communication. In communication engineering, "noise" is any element in any message not intentionally put there by the sender. As used here, this meaning is extended to include any element in any message intentionally filtered out by the receiver.

[2]I was on active military duty at the time with the Army Pictorial Service Division, and responsibility for the field test was one of my assignments. The data reported here have been made available for non-military use through the courtesy of Colonel Charles S. Stodter, Chief, Army Pictorial Service Division, and with concurrence of the military establishment.

field test. The items on which audience reaction is here reported and analyzed were dropped in the final revision of the questionnaire as irrelevant to the purpose of the field test of the film. In the preliminary version of the audience reaction questionnaire, the audience was asked to check the film characters on a list of 11 phrases or words conceivably descriptive of their behavior. On these 11 behavior traits, only eight (listed in Table I) will be considered here.

TABLE I

AUDIENCE RESPONSES TO FILM MODELS ON EIGHT BEHAVIOR TRAITS

Behavior Traits	Target Audience N = 45		Non-target Audience N = 43		Level of Confidence
	Tr. Model	Ex. Model	Tr. Model	Ex. Model	
Mechanically Apt	22	29	22	10	P = .0212
Pleasant	37	38	30	14	P = .0351
Takes Nothing for Granted	9	27	11	11	P = .0445
Careful	34	28	21	7	P = .0570
Patient	28	29	22	13	P = .1423
Self-Confident	27	23	17	8	P = .1814
Well-Educated	25	39	15	16	P = .2611
Intelligent	33	42	22	21	P = .2877
TOTAL	215	255	160	100	P = .0001

The preliminary version of the questionnaire was administered to two groups of soldiers in different viewing situations. The one group consisted of 45 soldiers enrolled in three different Army projectionist training courses. The film was shown on the first day of the course. This group constituted the *target audience* for which the film was produced. The other group consisted of 43 soldiers who viewed the film as part of a Saturday morning orientation lecture program regularly scheduled for all trainees. This audience was a *non-target audience.* It was neither enrolled in a projectionist training course, nor did it view the film as a scheduled part of this course.

Unfortunately, no information is available on the men in these two groups, other than that of target audience and non-target audience. Analysis of the data is thus limited to target and non-target audience dimensions of the two groups.

The intent of the behavior-trait items in the preliminary questionnaire was to obtain data indicative of audience identification with the

models portrayed in the film. It was assumed that more or less response on these behavior trait items would indicate more or less identification of the audiences with the models. Direct questions on identification did not produce useful results. Each audience was asked to check each character in terms of (a) I want to be like, (b) I am like, and (c) I seem to be like. The amount of response to these questions was too small to merit reporting or analysis.

Hypothesis on Effect of Viewing Situation

The conception of the problem of effect of viewing situation developed out of inspection of audience responses to the two model roles. We had predicted that both audiences would identify more with the trainee than with the expert, since both audiences consisted of military trainees, and since neither audience was expert in projector operation, particularly in operation of the new JAN projector set. When the responses were tabulated, two unanticipated trends began to emerge from the data. It is on the basis of analysis of these trends that our hypotheses are formulated.

The first trend was inferred from the difference between the totals of target-audience and the non-target audience responses on the behavior-trait items. These totals are shown in Table I. The target audience made a total of 470 responses on the behavior-trait items. The total of the non-target audience responses was 260. This difference trend can be observed somewhat uniformly on all eight behavior-trait items.

If responses to these items can be taken as some sort of index to audience involvement in the film presentation, the total number of such responses may be interpreted as an indication of the relative degree of involvement of the two audiences in the film presentation. Under this interpretation the data indicate a trend toward *greater degree of involvement of the target audience in the film* presentation as compared with the degree of involvement of the non-target audience.

Difference in degree of involvement between the target and non-target audience can also be inferred from interest ratings assigned the film by target and non-target audiences in the actual field test of the film. Approximately 400 trainees participated in the actual field test, with roughly 200 in the target audience and 200 in the non-target audience. Seventeen per cent of the target audience and 56 per cent of the non-target audience reported that the film held their interest only moderately or not at all, and 83 per cent and 44 per cent respectively reported the film held their interest very much or completely.

These ratings may be interpreted as additional indication of greater degree of involvement of the target audience. Interestingly enough, both audiences indicated some involvement in the film presentation, possibly

because of the interruption technique of the verbal content and studio treatment of the picture content.

The second trend indicated by the data was that *the target audience tended to identify more with the expert model* than with the trainee model, and that *the non-target audience tended to identify more with the trainee model* than with the expert model. This trend seemed worth pursuing in additional statistical analysis.

Table I has been arranged so that direct comparison can be made between the two audiences on frequency of response to both models on the eight behavior-traits. If our inference is correct, we can anticipate that the target audience will check the expert model more frequently than the trainee model, and that the non-target audience will reverse this order of frequency. Confidence levels of the differences associated with target audience and non-target audience responses to the expert and trainee models are shown in the last column of Table I. The five per cent level of confidence is generally accepted as evidence of statistical "significance."

The trend in audience identification is demonstrably significant in three traits and marginally significant in a fourth trait. The highest probability of chance in the eight traits is two out of seven, and the lowest is two out of a hundred.

Taken together, audience responses present a convincing picture of deviation of the audience groups from each other, the difference in each trait being in the same direction. The final probability of .0001 should be interpreted with caution in view of two considerations: (a) the lack of independence between the traits, possibly inherent in the data, and (b) the fact that consistent differences of trait responses in either direction would have been accepted as evidence that the reactions of the two groups were not the same. Consequently, the final probability must be multiplied by a factor of at least two. Presumably, the conclusions are not thereby affected. This somewhat unsatisfactory reservation cannot be removed owing to the unavailability of the original data.[3]

The evidence in Table I clearly supports the hypothesis that difference in audience responses to role models in this dramatized training film is, at least in part, a function of the target and non-target dimensions of the audience viewing situations. Once this is established, we can begin to speculate on the determinants of these audience reactions, and deal with these speculations on a sophisticated, i.e., general, level. Two such determinants can be postulated at this time.

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[3] I am indebted to Dr. Max A. Woodbury for advice and assistance in statistical treatment and interpretation of the data reported in Table I.

Determinants Postulated

First, differences in audience reactions to role models in the film appear to be related to *aspirations* of the audience. Audience reactions to the models tend to focus on the role to which the audience *aspires* more than on the role the audience *occupies* at the time and under the circumstances of the film-viewing situation. This seemingly apparent relationship is congenial with the American equation of success with vertical movement on the social scale, rather than with a fixed position on this scale. By the time they are drafted into military service, American young men have been thoroughly indoctrinated in upward mobility and its alleged virtues.

Second, the differences in audience response appear to be related to the *relative valuation* placed on the role of the model in the film. In other words, the game must be worth the candle. It appears that the value of achievement of the object of aspiration must be greater than the value of the effort required for its achievement if there is to be a strong tendency to identify with the model which symbolizes the aspiration.

With these two determinants, *aspiration* and *relative valuation,* derived by purely speculative analysis, it is possible to "explain" the differences in identification responses of the target and non-target audiences to the role models of the expert and the trainee in this Army training film. We may say that the target audience tended to identify more with the expert than with the trainee model "because" the target audience aspired to the role of the expert in projector operation, and "because" the cost of achieving this aspired object was not excessive when measured by a norm of $\frac{\text{Achievement}}{\text{Effort}}$, operative at the time and under the circumstances of the viewing situation. The converse applies to the non-target audience.

On the basis of our speculative analysis of determinants that presumably operated in target and non-target audience responses to the two model roles in *TF 11-1752,* it is possible to formulate the following hypotheses on audience involvement and audience identification in instructional motion pictures. No complete "explanation" is meant or intended in the formulation of these hypotheses.

Hypotheses

HYPOTHESIS 1. *Audience involvement and positive identification reactions to instructional (social reality) films are determined more by audience aspiration than by audience status at the time and under the circumstances of the film-viewing situation.*

HYPOTHESIS 2. *Audience aspiration to model roles presented in instructional films is determined by the ratio of the value of achieving the aspired role to the value of the effort necessary to this achievement, assessed at the time and under the circumstances of the film-viewing situation.*

This sort of hypothesis formulation is part of the necessary "patient, pedestrian work" on the problem of determinants of audience reaction to instructional films. These two hypotheses have been formulated in the attempt to account for unanticipated and unpredicted trends in audience reaction to an Army training film. The data on audience reaction do not "prove" the validity of these hypotheses or the operation of *aspiration* and *relative valuation* as reaction determinants.

Instead, the hypotheses provide bases of further research along what appear to be fruitful lines of investigation. They also provide bases for re-examination of current practices in story treatment, casting, and direction in dramatized instructional films.

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A THEORETICAL ORIENTATION FOR INSTRUCTIONAL FILM RESEARCH[1]

C. R. CARPENTER

The necessity to develop a set of guiding hypotheses for audio-visual research has been recognized for many years. It is very encouraging, therefore, to see the formulation of such theoretical hypotheses by the Instructional Film Research Program at The Pennsylvania State College. Eight of these are presented by C. R. Carpenter, together with relevant experiments.

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The purpose of this article is to outline theoretical hypotheses for experimentation on instructional sound motion pictures and to cite examples of relevant experiments of the Instructional Film Research Program.

Objectives

The objectives of the Instructional Film Research Program are related primarily to the problems of rapidly training and instructing large numbers of people. Also, the Program is oriented toward increasing the efficiency and levels of instruction, with the mass media (sound films, television and radio), for military, school, and university populations.

The Instructional Film Research Program and its military sponsors—The Navy's Special Devices Center and The Army's Signal Corps—are interested only in those types of films which train, instruct, inform, and orient people. The "entertainment" film is of interest only to the extent that its characteristics may serve the functions of education.

In view of the primitive stage of development of the taxonomy or classification of films, we have tentatively defined three categories of films:

(a) *Perceptual-motor skills training* films, or those which teach performances ranging from assembling machines to using languages.
(b) *Information communicating* films, or those which teach facts, principles, and concepts of different levels of complexity and abstractness.

[1]This article is a reprint, with slight modifications, of one which was translated by Robert Lefranc and was published in *Filmologie*, 1952, Volume III, No. 9, pp. 3–20, under the title, "Apercu sur une orientation theorique des recherches pour le film d'enseignement."

(c) *Attitude forming and attitude changing* films, or those which assist in forming or modifying attitudes, personal values, criteria of judgments, and personal orientation toward complex social situations.

In brief, the objectives of the Instructional Film Research Program are to seek facts and principles which will make it possible to improve generally the effectiveness of instructional sound motion pictures when employed for rapid training of large numbers of people.

In this article we shall outline some of the main theoretical "reference points" which, at least for the present, are used in stating research problems, in conducting research, and in interpreting the results. There are other hypotheses which may serve equally well these functions. There are systems of psychological theories which are more complete than the "reference points" which will be stated. Without doubt the proposed hypotheses will be, and should be, reformulated. Those of us who are working in the complex field of communications research are finding these hypotheses provocative and useful, and it is hoped that these viewpoints will benefit in various ways our colleagues who have interests similar to our own.

Methods, Procedures and Techniques

Basically we attempt to apply the general principles of the scientific method to the investigations of the interactions between films and viewers or subjects. The assumption is made that responses which are aroused or modified through the controlled stimulus of films can be measured. Therefore, quantitative statistical procedures and techniques are extensively employed.

It is assumed, furthermore, that film research must deal with definable characteristics of stimulus objects and situations which are represented in film presentations to arouse and to modify responses. Some of the characteristics which challenge investigation are the degrees of resemblance or similarity between the film representations and the objects and situations themselves, the validity or dependability of the information contained in the film, and channel capacitances (rate, amount and level of difficulty of the information presented, etc). These and other important characteristics must be defined in terms which permit the formulation of testable hypotheses.

Those *variables* or characteristics, which are relatively homogeneous processes, are controlled in experimental films especially produced for research purposes. Occasionally it is possible to find existing films which are so produced as to be suitable for research, but this is rarely the case.

Experimental films are often produced so as to contain several *variables*. Experimental films which differ systematically from each other in terms of one or more variables are called film versions. A single film version contains the stimulus material which is shown to one group of subjects in an experiment. It is possible by applying appropriate procedures and statistical techniques to ascertain the relative effectiveness of a number of variables contained in several experimental film versions. In addition, information can be collected on the *interactions* between or among variables.

It is usually necessary to use matched or equated groups of subjects (trainees or students). The individuals and groups are matched as nearly as possible on factors which are relevant to the research problems. Results from both experimental and control groups are analyzed and compared. Thus the effects of the experimental variables are measured.

The Instructional Film Research Program uses a variety of tests: standardized psycho-educational tests, tests especially constructed for specific experimental films, performance tests, evaluational interviews, and sometimes observations of the *actual behavior* of subjects. In all types of tests we are most sensitive to the requirements of *reliability* and *validity*. Tests must have their reliabilities established before results can be assayed and interpreted with confidence. The problem of validity is more difficult. We reason that if the effects on subjects of film instruction are valid, then, as a result of experiencing the film, there will be relevant changes in the behavior of the subjects. Performances will show observable changes; the amount of information which can be reported by subjects will increase; attitude changes will be reflected in test scores and in the behavior of subjects in real life situations. Ideally, we prefer to have test scores correlated with behavior changes which have occurred as a direct result of experiencing the controlled variables of the experimental films.

A modification of these procedures which is sometimes used is that of keeping the film stimulation constant and of varying the groups of subjects relative to identifiable and relevant characteristics. This procedure of *constant film stimulation* using varied groups of subjects is useful for investigating the relative effects of audience characteristics: for example, such variables can be tested as age, intelligence, institutional affiliation, educational level, film literacy, and so on.

We have not found, thus far, that subjective ratings, either by naive or heterogeneously trained panels of experts or by samples of subjects from the "target audiences" of the films, are sufficiently reliable to measure the differential effects of experimental variables. These estimates are found generally to have very low positive correlations with

measurable learning outcomes. However, it is believed to be possible to develop procedures, which would include extensive and intensive special training of panels of experts, to make reliable judgments about the effectiveness of film variables.

In summary, the Instructional Film Research Program's methods emphasize control of the stimulus variables or patterns of these in film versions, the quantitative (statistical) measurement of resulting effects, and the standard requirements of reliability and validity of the measuring instruments.

Theoretical Viewpoints or Hypotheses

SIGN SIMILARITY HYPOTHESIS: *That films whose signals, signs, and symbols have high degrees of similarity ("iconicity") to the objects and situations which they represent will be more effective for most instructional purposes than films whose signals, signs, and symbols have low degrees of "iconcity."*

Morris (11) defines "iconicity" as the quality of "signs" to simulate the objects and situations represented in the communication. Signs (or symbols) vary in "iconicity" to the degree to which they are similar to the things or situations signified. Thus, for example, sound motion pictures have potential capacities for high degrees of "iconicity" in representing objects in motion as well as reproducing authentic sound.

It will be recognized that this is a restatement of the problem of "realism" in films. However, this problem has three phases: (a) The problem of representing objects, situations and processes as they actually are, (b) the problem of representing objects, situations and processes in such a way as to facilitate a particular perception and understanding of them, and (c) the problem of representing abstract ideas and the force of ideas.

It is possible with the sound film medium to introduce correctives in the stimuli of the visual and auditory stream of events, taking into account limitations, distortions, and selective processes of normal human perception in order to insure the intended accuracy of perceptions, dependent cognition, and understanding. Thus, action may be slowed down or speeded up, small objects may be magnified, inaccessible parts of machines or organisms may be shown in animation. Likewise, sounds may be amplified or otherwise modified in order to convey the desired or intended impressions. In other words, film instruction should take into account and correct for the known characteristics, "filters," and limitations of selective sensory-perceptual processes, and introduce adjustments in such ways as to correct and supplement these processes in the interest of evoking the desired significances, understandings, impressions, meanings, and responses in the film viewers.

Experiments. Roshal (14) has demonstrated that the training efficacy of a motor-skill task (knot tying) is significantly increased when the film-presented model is shown as a performer would perceive the task (0° eye angle or "subjective camera") as compared with the film presented from the viewpoint of a trainee-watching a demonstrator (180° eye angle or "objective camera"). Furthermore, the same experimenter found that film representations of the performance of knot tying showing all the motions of the demonstrator were more effective in training than representations by means of a series of still pictures presented on film.

Preliminary experiments by VanderMeer (17) on the relative effectiveness of color versus black and white films for the teaching of identification of chemical compounds and snakes yielded ambiguous results relative to the similarity or "iconicity" hypothesis. However, the experiments suggest that color cues for identification may be eclipsed by other more potent cues, for example, of form and texture, but that identification cues *imprinted* in the learner by color may be more enduring, i.e., are retained longer than cues imprinted by black and white film.

Tyo (16) has produced a series of experimental films, and he is at present testing them. In this experiment it is postulated that films for teaching typewriting are more effective if high fidelity *authentic* sound accompanies the film than if *simulated* sounds are used. The final results of this and similar experiments should throw some light on the sign-similarity hypothesis.

The sign-similarity or "iconicity" hypothesis relative to sound motion picture transmitted content provides a promising challenge for continued experimentation.

RELEASOR-ORGANIZER HYPOTHESIS: *That the signals, signs, and symbols of sound motion pictures function principally as releasors and organizers of meanings and responses in human subjects.*

Given constant filmic stimulation of different individuals, reactions and interpretations vary greatly. Those reaction variations are dependent upon "individual differences." It is a stubborn, indubitable fact that the kinds of stimuli which are presented to subjects through the sound motion picture are perceived differently and interpreted with wide variations even though these stimuli be held constant. This is found to be true with subjects living in a relatively homogeneous culture; variations may be expected to become much greater when the viewers are from very different cultures.

These variations of responses and interpretations lead to the useful concept that the significance of the film mediated stimulation is both dependent (or inter-dependent) on the stimulation and on the activated brain processes ("engrams") of the experiencing subjects. Thus, it may be reasoned that the functions of signals, signs, and sym-

bols is *to release responses in subjects.* The stimulus values of communication signs in sound films are not inherent in the signs themselves. Signs and symbols *do not transmit* meanings; they release meaning when and only when the subjects respond. The characteristics of these responses relate closely to personal life history differences.

Communication stimuli may be said to be multivalent for different individuals. Therefore, to insure desired degrees of commonality of understanding and uniformity of responses it is required that the ranges of individual differences of audiences be taken into account in planning films for defined training or instructional objectives.

In this conceptual framework the problems of *ambiguity* (variations of meaning) of film communication must be solved, and can only be solved, by dealing with the complex problems of human variability.

The releasor concept of signs and symbols must be supplemented by the related *organizer* concept. Previously learned "engrams" may be modified by new stimulation, and even new *related* elements may be "imprinted." New relationships may be shown, and old responses modified by film mediated stimulation. The results are conceived to consist principally of the *reorganization* of previously learned neural-organic patterns which intervene between film stimulation and the subsequent actions or reactions of the individual.

Experiments: The results of most of the Instructional Film Research Program research projects have yielded data which can be interpreted to support the releasor-organizer hypothesis of film communication. The psychological concepts of accumulative experience, "apperceptive mass," prior set, predisposition to respond and "redintegrative" learning all relate to and may be used to support this releasor-organizer generalization.

Almost every Instructional Film Research Program project conducted thus far has resulted in some degree of reorganization, restructuring or modification of previous skills, knowledge or attitudes; learning has occurred. Thus, the releasor-organizer hypothesis is tentatively accepted as a working basis for further experimentation.

CHANNEL CAPACITANCE HYPOTHESIS: *That there are definable limits to the amount of content which can be channelled through a sound motion picture, i.e., through the visual and auditory modalities of perception; and there are limits to the capacities of individuals for reacting to, imprinting, and retaining the information or content.*

Relative to this hypothesis there are two postulates: (a) That there are optimal *amounts* and *rates* of presentation and *levels* (of difficulty) of significance and meaning for different kinds of films. (b) That there are wide individual differences for reacting to and assimilating information presented in sound motion pictures.

We have defined in many ways problems for research which are partial approaches to this *channel capacitance hypothesis:* Rate of film development, idea or concept burden, or simply, the amount of information presented during a given period of time.

Experiments: The problem of the amount of speech in the commentary accompanying the picture is a problem which is sub-specific to the more general problem. Both Zuckerman (18) and Jaspen (7) have investigated the problem of *level* or *amount* of *verbalization* (speech) in films relative to their instructional efficacy. For instruction in specific motor skills, using Navy recruits as subjects, these researchers found that the best amount of verbalization ranged from 100–130 words per minute of training film.

Much work has been done on the problem of finding the optimal picture-sound *"idea burden"* in films. Attempts were made to assay the number of ideas, concepts, or facts in a series of films produced to teach aerology to pilots, by exhaustively writing objective test questions on their content. Thus far, definitive results have not been obtained. However, we have the strong conviction that of the versions being used, some are too heavily weighted with facts, are too condensed, and contain too much information in relation to *presentation time* and the capacities of subjects for effective learning. Furthermore, we are aware of the other possibility that the *time* used in a film for presentation of a certain body of information can be extended so long that the film may have reduced relative effectiveness.

Relevant research problems involve attention spans, fluctuations of attention, sustaining attention, etc. Neu (13) found that neither relevant nor irrelevant picture and sound *attention gaining* devices when built into experimental films intended to teach identification of measuring instruments contributed to measurable increases in learning.

Ash (2) was able to demonstrate that students and Navy recruits learned as much from a series of films shown consecutively in a period as long as 60 minutes, as from distributed presentation, i.e., with short (15 minute) films of the series shown on different days of a week.

We have assumed that the amount of materials in an instructional film which can be responded to and retained by subjects is importantly dependent on the factors of the organization of the materials. A project is now in progress on the problem of determining the contributions of the prominence of the organizational outline of a film and the effects on the acquisition of factual information. Much of the thinking of "gestalt" psychology can be mustered to support this assumption. Theoretically, improved syntactical organization with good continuity would be expected to facilitate both comprehension and retention. Thus, we may argue for the selection of subject matter and the production of films

whose meanings have high degrees of contiguity and cohesiveness. Likewise, strong themes and good stories may provide necessary meaningful contiguity, and hence contribute to the instructional effectiveness of sound films.

PERCEPTUAL REINFORCEMENT HYPOTHESIS: *That multisensory modalities of communication may be, under certain conditions, more effective for instructional purposes than single sensory modality communication.*

The stimulus qualities of sound motion pictures are especially appropriate to (and limited to) the sensory modalities of vision and hearing. These two major sensory channels make available to those who would instruct through sound films or television a great range of channel capacitance. To use this potential capacitance effectively and fully is a challenging practical and theoretical problem.

Established psychological facts provide orientation toward a tentative solution: Stimulus processes even within the limits of a single sensory modality, e.g., vision, may interact to *facilitate* or to *inhibit* appropriate responses. When two sensory modalities are activated, e.g., vision and hearing, then possibilities are increased for both facilitation and inhibition (or interference).

It is easy to theorize that sound motion pictures should: (a) Employ the full potential capacities of both vision and hearing. (b) Arrange the streams, sequences, and patterns of stimuli, i.e., pictures and sound track, so that all of the elements are *integrated* and *mutally* reinforcing for the intended reactions or instructional objectives. (c) Insure that interferences, inhibitions, and distractions do not occur.

This line of thought raises interesting theoretical questions: What are the distinctive communicative functions of pictorial and sound signals, signs, and symbols? What kinds of instructional and communicative functions can *best be served* by each? How should the vision-hearing channels be integrated to achieve maximum impact or effectiveness of the streams of communicative processes?

There are two stubborn facts which we must consider and perhaps use: (a) Language and speech are much more highly developed for abstract communicative functions than pictorial representations. Speech is especially appropriate for representing and instigating abstract thinking and abstract concepts. (b) There appears to be greater dependence on visual impressions than on auditory impressions for checking on the *validity, authenticity,* or *dependability* of sensory experiences.

These considerations lead us to the core of the problem of choosing the sound motion picture for specific kinds of instruction for which its characteristics are most appropriate and feasible. The possibilities for "iconicity," specificity, dependability, and validity of pictorial lan-

guage, complemented by the possibilities for flexibility, abstractness, and generalization of verbal language should make the sound film and television appropriate for maximum possible use of multi-channel perceptual potentialities.

Experiments: Nelson and Moll (12) have conducted experiments on the relative contributions of pictorial and sound channels to learning from films. Their results show that considerable learning is achieved through either modality alone, but that the use of pictures and sound *together* produces significantly more learning than either channel alone.

INFORMATION-DEPENDABILITY HYPOTHESIS: *That information contained in sound motion pictures and perceived and learned by viewers varies widely in* functional dependability, *and that films with high degrees of informational dependability are most effective for instructional purposes.*

This hypothesis implies that the information in instructional films should measure up to the strict criteria of pragmatic and validity tests. If, for example, a film purports to describe and explain what "warm fronts" and "cold fronts" are as weather phenomena and how pilots should fly their planes relative to these weather fronts, then the actual experiences of pilots flying in these weather fronts should confirm the validity of the information learned from the instructional film about these weather phenomena. To accomplish this, the information must be *accurate* in details, *adequate* in thoroughness and scope of presentation, and *appropriate* to the *situation* of *application.* Conversely, the information cannot be inaccurate, sketchy and incomplete, nor inappropriate or ill-fitted to the full and real situation of application.

This hypothesis relates to a basic and necessary attitude of viewers toward learning from films, an attitude which, it is believed, strongly influences film learning, namely, the confidence of viewers in the information presented by the film and in the "authority" of the film.

Furthermore, the possibilities of having the information of the film *reinforced* and *confirmed* are increased if the validity of the information is fully supported by the experiences of viewers in real life situations of application.

Let us illustrate this hypothesis by another hypothetical example: Suppose that a film is to be produced to instruct Americans about the life of a French farmer. Then, if the film, when produced, has accuracy, adequacy, and appropriateness, Americans who learn from it will have this information *confirmed* and *reinforced* when the Americans have direct experience on French farms of the kind represented by the film. Furthermore, if another film is used with the same Americans to instruct them about the life in French villages, it is to be expected that they would be more receptive and learn more effectively from the film repre-

sentation, because of their *confidence in the dependability and integrity* of the first film.

Analyses of existing informational and instructional films reveal how inadequate they usually are when judged by the criterion of informational dependability. It is also observed that many of the imaginative, fanciful, and distortive characteristics produced and employed with artistic license are both inappropriate to and disadvantageous for informational films.

Practically no experiments have yet been done on the information dependability variables of instructional films in relation to their importance for facilitating their instructional and training values. The experiments in which the relative effectiveness of black and white and color films were compared, might be considered as having some bearing on this hypothesis.

PERSONAL NEED HYPOTHESIS: *That the effectiveness of the film will be importantly determined by the degree to which it activates personal needs in viewers for the information represented in the film.*

We subscribe to the dictum that learning depends on motivation, and furthermore that an important element of motivation is *activated* and *realized* personal needs for learning given content. Another way of expressing the central idea of this hypothesis is that when adjustment demands made on and recognized by individuals are related, through films, to information pertinent to these demands, individuals will learn rapidly and effectively; i.e., the films will be effective. From this viewpoint it may be argued that instructional objectives (goals) and the relevant information in films should be aligned with the learning objectives (goals) *of the viewers,* if the film is to be an effective means of instruction. In cases where this alignment of instruction and learning goals does not exist, then it will be necessary through the film, or by other means, to produce this relationship or substitutes for it, i.e., to motivate the subjects to learn. This is partially what we mean when we state that films must have interest for or develop interest in the viewers or learners.

It is postulated that externally imposed learning requirements, i.e., demands for effortful learning which is unrelated or poorly related to the accepted needs of the viewers, can only result in ineffectual learning of the film's content. The converse of this postulate is also held to be true.

A supplementary concept is that learning from films, like learning in real life situations, should have appropriate satisfactions and tension reducing rewards. Also, penalties, dissatisfactions, and increased tensions (anxieties) should be the consequences of failure to learn. Developing methods for making and using instructional films

which adequately *motivate* viewers is a challenging and largely unsolved problem.

Experiments: Results of the Instructional Film Research Program projects throw some light on procedures for increasing the motivation of film viewers for learning by creating a need in the learner and providing the means for satisfying it. Brenner, Walter, and Kurtz (3) found some increase in specific learning to result from inserting questions in films and requiring the viewers to answer them. Jaspen (6) demonstrated that actual "participation" in which the learners were required to perform an assembly task at the same time as the assembly task was being presented on the screen, increased learning. This was true *only* when the films had a rate of development slow enough to permit participation without loss of attention to the film. Roshal (14) got negative results on the participation variable when the film demonstrations of the task were done at a normal demonstration speed (i.e., when the films had too fast a rate of development). Allison (1) found some effects of "induced anxiety" i.e., by emphasizing in pre-film instructions that learning was important to the students and that the scores made on tests of learning from the films would affect their future in college. Hirsch (4) found that when students were told the results of their attempts to answer questions on films, i.e., whether their answers were correct or incorrect, learning was increased. Thus, at least a beginning has been made toward research objectives which may make it possible to manage the motivation of subjects for more effective learning from films.

PERSONAL INVOLVEMENT HYPOTHESIS: *That, other things being equal, the instructional film which provides for the greatest degree of personal involvement in the filmically presented situations will be most effective.*

The concept of involvement is complex and, among other things, encompasses three kinds of processes: (a) The *projective* responses of subjects, whereby they submerge themselves in the content of the film, i.e., the scenes, sequences, story, characters, problems, and issues. (b) The *introjective* responses of subjects, i.e., the processes of abstracting out of the film elements which are personally assimilated. (c) The *retention and use* of assimilated processes as determinants of succeeding responses and actions.

Many personal and situational factors operate either positively or negatively to affect the degrees of the subject's involvement in film situations. To define and control these factors is a principal line of research which should be vigorously exploited. The processes of projection, introjection, and reactions of subjects relative to the situations represented through films are so complex that the development of appropriate experimental designs and their execution is extremely difficult.

Experiments: Roshal (14) experimented with film versions on knot tying in which he compared the effectiveness of a demonstration photographed from the learner's eye viewpoint ("subjective" camera), with a demonstration photographed from the observer's viewpoint ("objective" camera). The superiority of the subjective camera angle could conceivably be due to the fact that it permitted a greater involvement of the learner. The "hands" compared with "no hands" version yielded ambiguous results.

Kishler (8) investigated the problem of the effects of religious affiliation of the subjects and prestige value they attached to the role of the main character (Catholic priest) in the feature film "Keys To the Kingdom." Using groups of Catholic, Protestant, and Jewish subjects, Kishler found that institutional affiliation, and especially the prestige value attached to the role of the main character, slightly increased learning. Also, Catholics showed somewhat greater changes in attitudes in the direction suggested by the theme of the film even though their pretest scores were higher than those of Jews and Protestants before exposure to the film. It is speculated that these results could be accounted for in terms of the involvement hypothesis.

Mertens (10), using a series of existing and selected mental hygiene films with first year college girls as subjects, got results which suggest that the girls became more involved and remembered the films better if the personal adjustment problems and the social situations portrayed in the films were similar to the personal problems and social relations of the subjects themselves.

These experimental results are merely approaches to much needed continued investigations of the complex problems and processes which are subsumed under the hypothesis of personal involvement in relation to learning from instructional films.

LEARNING PRINCIPLES HYPOTHESIS: *That the established principles of learning which have been developed by psychological and educational research have varying degrees of applicability in film mediated instruction, and that the application of the best of these principles will improve the effectiveness of film instruction.*

A corollary of this very general proposition is that experimental films may be used in research to develop *new* principles and to correct, modify, and extend principles which have already been formulated. It is reasonable to argue that principles which have been formulated on the basis of data collected by "molecular" types of experiments like the salivary reflexes of the dog, eye-lid reflex of humans, or even behavior of rats in a maze almost surely will require modifications when applied in the "molar," more dynamic and complex experiments with sound motion pictures. There seem to be possibilities for film research to modify old and develop new learning principles which will be appropriately

applicable to real life situations. Confidence in these possibilities is based on the close potential resemblance or similarity between film presented stimulation and real life situations.

It is an encouraging fact that instructional film research can draw on the theoretical resources of related fields; a vast experimental literature and body of facts and principles on learning processes exists which can be used both for forming research hypotheses and for testing in practical film production and use. Smith and van Ormer (15) have brought together some of the learning principles which have relevance to film research, production, and use. Hoban and van Ormer (5) have reviewed the experimental literature on films for the period 1918–1950.

We can only direct attention to this body of information which has great importance for those interested in sound motion pictures as a means of instruction. Also, attention should be called to the neglect on the part of students of the film and producers to consider the use of literature on the psychology of learning.

Experiments: The research results of the Instructional Film Research Program confirm the applicability of some learning principles as means of improving instructional films. A number of these experiments have already been cited. There are other examples: Relative to the principles of repetition and reinforcement Brenner, Walter, and Kurtz (3), Jaspen (7), McTavish (9), and other investigators have found that repeating the showing of films increases the amount learned from them. Experiments now in progress on "repetitive impact training" using film loops promise important results for some kinds of instruction.

The repetition of a film *en toto* is perhaps a crude even though useful way to apply the learning principles of repetition and reinforcement. Experiments should be conducted on the possibilities of *repetition with variation in the organized framework* of the instructional theme of the film. The application of these principles in ways analogous to their employment in music, poetry, and drama may yield significant results.

Learning involves the avoidance of errors. Trial-error-and-success learning has been extensively investigated and discussed. Jaspen (7) has shown that "showing errors to be avoided" in films designed to teach an assembly task significantly facilitated the acquisition of the skill.

These examples emphasize the importance of testing the applicability of learning principles which have already been formulated in attempts to increase the effectiveness of instructional sound motion pictures.

It is neither desirable nor necessary to deal systematically and completely with this highly generalized learning principle hypothesis in this article.

General Summary

The objective of the Instructional Film Research Program is to discover facts and principles for increasing the effectiveness of the instructional sound motion picture for rapid mass training. Quantitative methodology and statistical techniques are extensively used to assay and measure the effects of film presentations. It is assumed that effects are revealed in terms of changes in the behavior of subjects. An important requirement of film research is the controlled production of experimental film variables and versions for comparative test purposes.

The following hypotheses have been outlined briefly: The sign similarity or "iconicity" hypothesis, the releasor-organizer hypothesis, the channel capacitance hypothesis, the perceptual reinforcement-interference hypothesis, the information dependability hypothesis, the personal need hypothesis, the personal involvement hypothesis, and the generalized learning principles hypothesis.

Selected Instructional Film Research Program experiments were cited relative to these hypotheses.

A general outline of theoretical considerations has been given in order to inform those who are interested in the instructional film and educational television of the present theoretical frame-work and examples of research problems of the Instructional Film Research Program of The Pennsylvania State College. A systematic review of all pertinent theory and research has not been attempted.

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WORLD COMMUNICATIONS

ANDRIES DEINUM

THE FARMINGTON CINEMA COLLECTION

It is an often-forgotten fact that many of the early experimenters with film did their research at universities. Two great pioneers come to mind at once: Muybridge, at the University of Pennsylvania, and Dr. Marey, at the Collège de France. Equally ignored is the truth that film was considered a means for recording fact, not fiction, by the inventors. These idealists looked at film primarily as a tool for better education and scientific research. Edison, for example, expected films to replace text-books within a very short time. Unfortunately, the field of film did not maintain continued academic favor. The tenth Muse was thrown to the dogs; some say she became a prostitute—all because men of intellect began to look down on the "new toy." It was not until decades later that film again gained a semblance of respect at universities. It is a sober statement to say that this early neglect of film by the very institutions that had incubated it and that stood to gain by its growth, forms the first key event in the general history of film.

Film, then, was largely abandoned by the scientists, the artists, and the educators during a crucial period; abandoned to the side-show operators, who have remained in virtual control of it to this day. To what degree this event stunted the social and artistic development of film is impossible to determine, but there is little doubt that the resultant lack of critical and artistic stimulation for the outcast medium has tended to stultify and formalize its practice. Most possibilities inherent in this pliable means of communication, meeting ground of art and science, remain to be exploited. The field is wide open to meaningful, directed experimentation and research. Film's days, as occupied territory, are num-

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bered. We are beginning to recapture the positions we lost half a century ago. High time, too.

A great handicap which students of film now have to face, particularly in this country, is the absence of a comprehensive—and available—body of literature, essential as a basis for advanced work, and a constant source of germinating ideas, while preventing duplication of effort. When one realizes, as an instance, that psychology, a potential science, and film, a potential art, grew into being simultaneously during the last quarter of the nineteenth century, and when one compares the amount of classified, indexed literature at hand in each field, the impact of the academic neglect of film will become all too clear. Film still barely has its foot in the door of the university.

The problem, in brief, is this: There never was much good theoretical and critical writing about the film in English. Most of what there was either originated in Great Britain or it was translated. By now, much of it has been allowed to go out of print. In any case, the preponderance of stimulating, useful ideas is to be found in periodical literature, usually magazines of small and limited circulation, now hard—if not impossible—to obtain. Add to this the fact that a great amount of pertinent, foreign material was never translated at all, and one can understand why the cross-fertilization of ideas about film so far has been rather thoroughly hampered in the United States.

It must be admitted, of course, that for some privileged students living near certain libraries, such as the Museum of Modern Art Film Library in New York, or the Library of the Academy of Motion Picture Arts and Sciences in Hollywood, not everything is as disheartening as the situation outlined above seems to imply. For those having access to such reference tools as that fine W. P. A. product, *The Film Index,* so brilliantly edited by Harold Leonard, wide vistas have opened. But even in these cases, limitations exist. The inter-library loan system does not apply to the two libraries mentioned, even if one knew what to request, and *The Film Index,* invaluable as it is, only covers material up to 1936; material—like so much of the literature about film—written by people whose ideas took form and developed during the era of the silent film; not prejudiced, useless material, to be sure, but certainly predisposed.

As far as I know, no university library in the United States has made a systematic coverage of materials—books, pamphlets, serials, periodicals—concerning the increasingly important subject of film in all its aspects. At the University of Southern California, we are now, in fact, attempting this very thing, not just a systematic selection of the main literature, but an exhaustive, comprehensive coverage of the field in all languages using a Latin alphabet. This ambitious project got its start only recently, and naturally we make no claims for it yet, beyond stating

that within a year's time we expect to have the largest holdings in our field of any library in this country.

Why are we doing this? For two reasons: 1) a need, and 2) an obligation. Let me explain: We, of the University of Southern California Department of Cinema, have long fretted at the absence of certain books and periodicals in our library. With the coming of Dr. Lester F. Beck, as head of the Department, two years ago, and the subsequent change in the direction of our work from the strictly production aspects to an equal emphasis on the more theoretical, research aspects of film, the need for the missing books and periodicals became paramount. Fortunately, this need fitted right in with an obligation which the University Librarian, Dr. Lewis F. Stieg, had accepted some time before. This obligation consisted of a commitment to make the Library of the University of Southern California responsible for the subject-field of Cinema under the Farmington Plan. What is this Plan?

The Farmington Plan owes its name to a small town in Connecticut where, in 1942, it was proposed by three of America's leading librarians: Archibald MacLeish (then Librarian of Congress), Keyes D. Metcalf (Harvard) and Julian Boyd (Princeton). Backgrounding the proposal was the knowledge that in prewar years the foreign acquisitions of American libraries had been selected in an almost completely haphazard and *laissez-faire* manner. Many important books in various languages were not acquired by any library, while at the same time, there was much wasteful duplication among libraries. To prevent this from happening in the postwar years, the Plan was formulated and then implemented. In essence, it provides for the cooperative acquisition of eventually all books being published anywhere in the world, so that at least one copy of each country's publications will be available in the United States. It should be noted that if a single library were to attempt this, even on a much modified scale, it would soon exhaust its finances *and* its space.

Participating in the Plan, under the direction of the Association of Research Libraries, are the fifty-four principal research libraries in this country, each of which has the responsibility for the comprehensive coverage of one or more subject-fields assigned to it. The Plan started operating on January 1, 1948, in a modest way, with the literature of France, Sweden and Switzerland. Since then every year new countries have been added, so that as of now the following additional countries are covered: Australia, Austria, Belgium, Bolivia, Denmark, Ecuador, Germany, Italy, Mexico, Netherlands, Norway, Peru, Portugal and Spain. Other countries are in the process of being added. Great Britain is excluded for the reason that it is already well covered by most libraries independently.

Once established in a country, the Plan works very simply: In each country a reliable dealer is appointed, who is charged with supplying one

copy of each book published in his country to the library responsible for its particular subject field. The libraries themselves have no choice in the matter. They get everything, with the following exceptions: non-Latin alphabets; books costing more than $25.00; juvenile literature; music scores; privately printed works; public documents; reprints; theses; numbered series issued by societies and academic institutions; numbered series of any kind that began before the Plan went into effect; sheet maps; textbooks of pre-college level; and translations from other modern languages. The dealer is expected to send a copy of the first number of each new periodical. The libraries then decide whether they want to subscribe or not. One final item of interest is that a Union Catalog of all materials acquired under the Farmington Plan is maintained at the Library of Congress.

The University of Southern California Library is now receiving an increasing flow of books and periodicals concerning film from all over the world; the Farmington Plan promises to fulfil our future needs most adequately. Our main worry, at this point, is the past—the missing or incomplete files of important periodicals, the out-of-print books. Special funds have been appropriated and a concerted effort is being made to fill the gaps in our collection. We intend to scour all possible sources. We want everything. In the meantime, we are naturally appreciative of gifts of rare materials, or suggestions as to where they can be obtained.

Collections like ours are of little value unless they are constantly being used. Through this column we hope to keep you informed of what seem to us the main items of interest. All of our holdings are available through the inter-library loan system, or through our microfilm service. As an aid in further utilization, we plan to publish a selective, critical bibliography of *books* about film. This bibliography will form the basis for more extensive subject-bibliographies, which will also include periodical references. Since so many of our acquisitions are in foreign languages, we are trying to set up a translating service—anything to get the stuff around!

Examples

Comitato Italiano per il Cinema Educativo e Culturale. Il Cinema nei Problemi Della Cultura. Rome: Bianco e Nero, 1951. 156 pp.

This volume contains the speeches and proceedings of the International Congress of the Italian Committee for the Educational and Cultural Film, held in Florence during 1950. A wide range of subjects was covered: Film and Morality, the Social Function of Film, the Educational Film in France, the Student and the Film, and many others. The participants in the Congress represented a broad, cross-section of French and Italian opinion in the field, from the strictly academic theoreticians to practicing artists like the brilliant film-composer, Roman

Vlad, who is concerned here with film as a means to musical education; and Jean Lods, one of the leading documentary film makers in France, discussing the cultural and moral advantages offered by the film. The book ends with the discussions and resolutions of the Congress.

Guido Aristarco. Storia delle Teoriche del Film. Turin: Einaudi, 1951. 296 pp.

A unique book—this is, to my knowledge, the first attempt to write a comprehensive history of film-theories. It is based on the sensible notion that not only the practice of film but also the thinking about it has a background of some importance. After much history of the object: film; it is good to have, finally, the first book devoted to the history of the concept: film. This will hardly be the last book on its subject, but it is not to be neglected on any account. The writer is particularly well qualified for the job. He is without doubt one of the most considerable of the crop of young Italian film-scholars that has grown up since 1944. He was born in 1918, and he has already done a great amount of perceptive, critical writing about the film, which ought to be made available in English. He is also a practicing screen-writer. He collaborated, for example, with the director, Aldo Vergano, on that great and moving resistance film, *Il Sole Sorge Ancora.*

Aristarco begins by discussing and analyzing the European precursors of present-day film-theory, writers practically unknown in this country—Ricciotto Canudo, Louis Delluc, Germaine Dulac and Hans Richter. It should be noted in passing that the writer gives some evidence of bias by neglecting two important American precursors: Vachel Lindsay and Hugo Muensterberg. The true systematizers of film knowledge are then dealt with in the great detail they deserve: Bela Balazs, Vsevolod Pudovkin, Sergei M. Eisenstein and Rudolf Arnheim. Paul Rotha and Raymond Spottiswoode receive less attention since they were essentially popularizers. Urban Gad, a neglected Danish philosopher of the film has a special chapter, while Umberto Barbaro and Luigi Chiarini, Italy's contribution, naturally receive fair treatment. Probably the most intriguing part of the book, however, is Aristarco's long final chapter in which he discusses his own ideas about the crisis of film and film-theory, and pleads for revision of many accepted notions. There is an invaluable bibliography.

Armand Lanoux. L'Enfant en Proie Aux Images. Paris: Editions Labergerie, 1950. 103 pp.

This volume is a part of the so-called "antidote" series of books published by this firm—antidotes against various forms of public neglect, or attempts to lead the public by the nose. Lanoux's book is concerned with the child as prey to the film, the child as the victim of images. His point of view is summed up by the motto of the book, a remark by Lucien Descaves in 1912: "One allows children to go to the movies. The moment has come for the movies to come to the children." The book surveys the field of children's films in France and concludes that France is far behind England, the U.S.A. and U.S.S.R. The book is furthermore a compendium of qualified French opinion on the general subject of children and film. In boxes on every page, one finds pertinent quotes from French authorities in the field. The book reports new ideas on the matter and it proposes solutions that are beyond the scope of this column to evaluate.

Maurice Bessy. Les Truquages au Cinema. Paris: Editions Prisma, 1951. 252 pp.

Many books have come out giving good general descriptions of how films are made, but few have paid much attention to *exactly* how they are put together. The details are usually glossed over, but it is these very details that are fascinating. The creation of the different illusions that largely make up a film has remained a secret for so long, because the aura of mystery so created helped to sell tickets at the box-office—or so it was claimed. The result of this was that the people who deserved to get known: the cameramen, the special-effects men, the technicians in general, remained unknown and unsung—much to the detriment of all of us enthusiasts of film. We can now make up for this lack by reading Bessy's compendium, the first comprehensive treatment of practically all the effects being used in film. A special, excellent feature of this book is formed by the profuse illustrations, both photographs and drawings, which ought to make the book understandable even to those not knowing a word of French. Little is left out, to my knowledge. Optical and laboratory effects are fully covered, as are the special effects such as rain and aerial combat, sound-, color-, and light-effects and background processes. A very useful book, truly educational.

BOOK REVIEWS

MEIERHENRY, WESLEY C. *Enriching the Curriculum Through Motion Pictures.* Lincoln, Nebraska: University of Nebraska Press, 1952. Pp. 255. $4.00

There have been a number of limited experiments on the value of teaching films at various levels and in various subjects, a few of which have been designed for and analyzed by statistical techniques. In this book, Meierhenry reports on the first large-scale experiment on the contribution of educational motion pictures to the improvement of learning in high school. The Nebraska Film Program, financed by the Carnegie Corporation and assisted by the Motion Picture Association and a number of producers of films, was a statewide program that lasted four years, 1946–1950. It tested achievement in a number of school subjects in Science and Social Studies and in special Convention programs. It also experimented with changing the beliefs of students through the use of films on the United Nations.

It is good to see another experiment in teaching films carried out under fairly rigid statistical conditions. Employment of the t-test, chi-square, analyses variance and co-variance sets a high standard. Audio-visual educators will be particularly pleased by the use of special achievement tests based on the content of the films in addition to the use of standardized tests. Thus provision was made to find specifically how much the films enriched the teaching program. To the extent that this enrichment is becoming essential in modern education, teaching films are becoming complementary rather than supplementary.

The basic purpose of the experiment was to find out how much improvement could be effected by the use of teaching films readily available from producers and used in regular classrooms by regular teachers. The classes were divided into control and experimental groups. The result will be disappointing to the film enthusiast, because of the lack of significant improvement by the film groups on the *standardized tests.* On the other hand, enrichment as shown by the *film tests* was always significantly better in the film classes as compared with control classes. In American history and general science, the improvement was pronounced. In face of these somewhat disappointing results, it is gratifying that the report sticks to tests of significance and does not feature increments in learning translated into misleading percentages.

Possibly the reason Rulon, Arnspiger, and others almost always have found significant improvements of achievement is that their experiments were small

enough to be able to control the teacher variable. In the Nebraska Program, teachers were used largely as they came. Wittich demonstrated that the film utilization by the teacher is an all important factor, large enough to eclipse other variables. It is true that the Nebraska teachers involved did get some in-service-training on the proper use of films, but this minimum training probably did not change most teachers' methods over-night. Statistical analysis was made of the difference of achievement between the pupils taught by teachers who did or did not have audio-visual courses. There was no significant difference. Meierhenry points out that audio-visual courses vary from institution to institution and that the passing of such a course is no guarantee that the teacher will utilize films in his classes to get the utmost out of the films.

A particularly interesting chapter is the one statistically analyzing the relationship of intelligence to learning from motion pictures. The author attacks the common method of comparing dull and bright students' film learning on the basis of a percentage improvement over the previous knowledge. He points out that a very dull child, knowing little, needs to learn little to make an imposing percentage improvement.

The most interesting aspect of the Nebraska Program is its outstanding achievement in "action research" as contrasted with what Hilgard calls "impoverished research." In spite of the quantity of statistical results, it is evident that one of the primary purposes was to effect a large scale use of teaching films in Nebraska schools. The program involved teamwork by the University of Nebraska, the University of Omaha, the State Department of Instruction, the State Teachers' Association, the State Colleges, the Parent Teachers' Association, and other agencies. The chapters reporting the results of cooperative work at the State Colleges makes interesting and satisfying reading. Thus, as good action research, the Nebraska Program permeated the State. Probably more important than the experiment itself is its lasting effect on the teaching methods in the schools and on the attitudes of the people of the State concerning what constitutes modern education. Missing is a report of the impression of the Program on parents and other taxpayers.

In the brief of previous research the reader may get an impression that such experiments as Rulon's and Arnspiger's were too small or too short to be definitive, whereas, actually, without their positive results in careful experiments, the investment in the Nebraska Program would have been risky. Action research must be based on more limited pilot experiments.

It is safe to predict that, as good as the report is, the results of the Nebraska Film Program will not influence other states very much, unless this same report can be republished in a short (20 pages) concise summary of a few of the salient points. This should be in at least two colors, heavily illustrated and even spiral bound, the kind of a book that a school administrator or a taxpayer will be attracted to and read in a few minutes. Thus the four years of hard, careful work in Nebraska could affect education all over the country.

San Francisco State College PAUL R. WENDT

RESEARCH ABSTRACTS

TELEVISION

FORDHAM UNIVERSITY. "Training by Television: the Comparative Effectiveness of Instruction by Television, Television Recordings, and Conventional Classroom Procedures." SDC Report 476-02-2. Special Devices Center, Port Washington, L. I., New York. Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. 75¢.

Purposes: To find out (1) the comparative effectiveness of television, television recordings (kinescopes) projected as motion pictures, and conventional classroom instruction; (2) the factors that result in good television programs; and (3) the acceptability of television instruction to Naval Air Reservists.

Procedure: Comparable groups of reservists were taught a series of training lessons by one of the three methods listed above. Evaluation of the effectiveness of the programs was made by information tests and comments by the trainees.

Results: (1) Instruction by live TV and TV recording were superior to local instructors. Live TV and TV recordings were about equal in their effectiveness. (2) Direct TV narration, in which the instructor talked directly to the trainees, appeared to be the most effective method of presentation; animated sound film seemed also to be effective, but the combination of dramatic action and narration was not as effective. These observations are claimed to be suggestive rather than conclusive. (3) Comments made by the naval trainees showed that, "on the whole," they liked TV instruction very well, over half the comments being favorable. (4) The TV evaluation staff observed that the reservists liked the TV programs and remained attentive and interested, that more visual materials and better production techniques should have been used, and that trainee participation by means of talk-back circuits was not satisfactory. (5) Several problems were mentioned as needing solution: good TV instructors, writers, and directors; "psycho-educational experts" to plan TV lessons; a method of rapidly measuring program effectiveness; technical equipment and engineers; and adequate distribution facilities.—*W. Allen.*

FORDHAM UNIVERSITY. "Training by Television: A Study in Learning and Retention." SDC Report 476-02-3. Special Devices Center, Port Washington, L. I., New York. Available from Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. 75¢.

Purposes: To find out (1) if television can be used effectively to teach Army reservists, (2) the extent to which men remember what they learn by television, (3) the best methods for teaching by television, and (4) the acceptability of television instruction.

Procedure: A series of eight telecasts, telling how a typical Army infantry division helped to repel a hypothetical invasion by an "aggressor" nation, was broadcast to Army reservists in ten major cities. Information tests and attitude questionnaires were used to evaluate the programs.

Results: (1) All grades of reservists made statistically significant gains on the information tests after viewing the telecasts; (2) reservists remembered what they learned by TV, officers retaining 85% and enlisted men 65% when they were retested four or six weeks later; (3) the best teaching method was narration combined with drama or with film that explained and amplified what the narrator was talking about, drama by itself not being very effective; (4) topics which were treated explicitly resulted in large knowledge gains, whereas topics treated sketchily or indirectly were not learned by most of the reservists; and (5) reservists liked to be taught by TV, more than half preferring it to conventional classroom instruction and saying it was more instructive than the average training film.—*W. Allen.*

U. S. DEPARTMENT OF AGRICULTURE. "Effectiveness of Television in Teaching Sewing Practices." Extension Service Circular No. 466. Washington, D. C.: Government Printing Office, June, 1951.

Purpose: To determine the effectiveness of the "Let's Make a Dress" series of television programs with a selected group of homemakers.

Procedure: The study was based upon personal interviews of a sample of Washington, D. C., women who requested a Department of Agriculture sewing bulletin, and who owned TV sets at the time the eleven TV programs were broadcast.

Results: (1) A high percentage of the women viewed the programs, 91% viewing at least one and 60% four or more. The average viewers for the entire series was 44% of the total audience. (2) The TV programs had to compete for attention with many family responsibilities. (3) 90% of the women learned new things from the programs, about half using at least one of the practices demonstrated. The proportion of women using the practices increased with the number of programs viewed. (4) The data point emphatically to the importance of a bulletin or similar printed matter as a supplement to TV demonstrations in teaching sewing practices. (5) Most of the women favored longer programs (than 12 minutes) and the continuance of the twice a week schedule, 98% wanting more TV programs on sewing. (6) The authors conclude: "The high interest of this limited audience in more television programs on sewing indicates the potentialities of television as an effective medium for conducting an adult education program. It appears to be peculiarly adapted to reaching young homemakers and mothers of small children who cannot readily participate in group activities outside the home."—*W. Allen.*

MACCOBY, ELEANOR E. "Television: Its Impact on School Children," *Public Opinion Quarterly*, 1951, 15, 421-444.

Problem: How will increased viewing of television affect children's personalities, family relationships, and social interaction within their own groups?

Procedure: In a Cambridge, Massachusetts survey, interviewers from Harvard and Boston Universities contacted 332 mothers of 622 children between the ages of four and seventeen. Both owners and non-owners of television sets revealed in "open-ended" interviews the detailed activities of their children for the week preceding the questioning, (December, 1950-February, 1951). Comparisons between TV and non-TV children, chosen through the use of area sampling methods, were facilitated by matching the groups according to age, sex, and socio-economic status.

Results: (1) While professional people were apprehensive about TV's influence on their children's psychological welfare, middle and lower income parents welcomed it as an entertainer, educator, and "pacifier" or "baby-sitter." (2) Social interaction among families and children's play-groups suffered as passive, solitary televiewing increased to 2½ hours on weekdays and 3½ hours on Sundays. (3) Although TV robbed time from radio, movies, reading, playing, practicing musical instruments, and other "creative" or "productive" activity, it apparently interfered very little with homework. (4) Bedtime and mealtime procedures, however, had to be revised. TV children not only went to bed later, but sometimes ate their meals in front of the set.

The author concludes that TV has increased quantitatively children's intake of fantasy to the point that the "interference with practice of real-life skills," "vicarious habit formation," "addiction to excitement," "frustration tolerance," and "substitute satisfaction" warrant thoughtful consideration when they describe our child televiewers.—*G. Porter*

MOTION PICTURES

KOPSTEIN, F. F., SULZER, R. L. and LUMSDAINE, A. A. "The Value of Using Multiple Examples in Training Film Instruction." Report No. 25. Human Resources Research Laboratories, Bolling Air Force Base, Washington 25, D. C., May 1952.

Purpose: How is the amount of learning from a training film affected either when additional examples are incorporated in a film or when supplementary examples are presented after the film? Can common kinds of errors be reduced by designing additional examples to deal specifically with these mistakes? What kind of material and what types of trainees benefited most from additional examples?

Procedure: Thirty-two classes of Air Force trainees (about 1300 men) were shown standard films on the reading of the micrometer. Half the groups saw a film with three different examples and the other half saw a six-example film. Following the film, half the groups were given four additional examples with a sound slide film. All groups were given both pre- and post-tests.

Results: (1) The amount learned increased consistently with a greater number of examples, whether the examples were given in the film itself or in the supple-

mentary instruction. (2) Giving further supplementary examples made a significant improvement even after the number of examples in the original film had been doubled. (3) The "rate" of improvement diminished as the number of examples increased, suggesting a "saturation point," dependent on the difficulty of the material, after which further examples would fail to produce more gain. (4) Common mistakes were less often made when supplementary instruction was used to emphasize the more difficult material. (5) The more intelligent men benefited even more from additional examples than did the less intelligent men.—*E. Faison*

MICHAEL, D. N. "Some Factors Influencing the Effects of Audience Participation on Learning from a Factual Film." Memo Report No. 13A Human Resources Research Laboratories, Bolling Air Force Base, Washington 25, D. C.

Purpose: To investigate the effects of several factors on learning from a film employing "audience participation." Specifically, what differences are there when participation is *overt* (observable) or *covert* (mental)? Is there greater learning when the subjects have *"knowledge of results"* following participation? Are the gains produced by participation due primarily to increased *motivation* or to straight *practice* effects?

Procedure: Eight experimental groups (about 640 high school subjects) were shown a film on civil defense against the atom bomb under conditions of "audience participation;" that is, the film was stopped periodically and the audience was asked certain questions on what they had just seen. Half of these groups participated "covertly," *i.e.*, "thought" the answers, while the other half wrote their answers. Half the groups were provided with "feedback," *i.e.*, knowledge of the correct answers to the questions just given, while the other four received no "feedback." It was announced to half of the groups that they would have a test after the film. This was intended to produce higher motivation for these groups. Fifty per cent of the items in the test given at the end of film had been used on the earlier participation periods. The purpose of this was to investigate the influence of motivation (set) *vs.* sheer practice. Sheer practice would be expected to improve test scores only on items practiced while superiority on *non-practiced* items would be attributed to motivation factors.

Results: (1) Audience participation, whether overt or covert, and with or without knowledge of results, resulted in considerable improvement in learning verbal material as compared to simple viewing of the film. This improvement seems to be due to practice effects and not changes in motivation since gains were found only on points covered in the participation sessions. (2) The most important single factor was *knowledge of correct response.* (3) There was no significant difference between the level of learning achieved under overt practice conditions and under covert practice. (4) Warning that a test would follow did not produce significantly different learning.—*E. Faison*

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